American Druggist
AN ILLUSTRATED TRADE JOURNAL.
VOL. XX. No. 15. NEW YORK, AUGUST 1ST, 1891. WHOLE No. 213.

Progress of Chemical Theory.

THE last chemical lecture course of the Franklin Institute was inaugurated by an address from Dr. Persifor Fraser on "The Progress of Chemical Theory: its Helps and Hindrances," which has only just now become accessible. We select from it some portions relating to the chemical knowledge possessed by the ancients, and to the development of chemical views up to the time of the phlogiston theory.

At the very outset of the subject we find a generalization of old Democritus (who lived 450 B.C.) so astounding in its character, and so accurate in most of its statements, that only in the past few years have chemists been able to reach these profound thoughts thrown across the ages into the midst of the civilization of our time, as the legend has it that Bruce's heart was thrown by the Douglas into the hosts of the Saracens to stimulate the ardor of the Christian knights to charge and recover it. But, unfortunately, no such effect was produced by the good old laughing philosopher; though at a snail's pace, and after a lapse of 2,300 years, we have reached the spot. Briefly, as transmitted to Epicurus, and expanded by Lucretius B.C. 99–55, it was thus:

The universe consists of *atoms* and *space*. The atoms are of many forms and of different weights, and the number of atoms of each form infinite. Change is only the combination and separation of atoms! Atoms are in constant motion. "First beginnings" or atoms are never destroyed or worn out. The difference between a hard body like iron and a soft body like air is that in the first the atoms move to and fro within small distances; in the soft body they move freely or rebound from each other only at long intervals.

Bodies are partly "first beginnings," partly unions of "first beginnings." The properties of the bodies formed of the groupings of "first beginnings" need not be like the properties of the "first beginnings" themselves. "It matters much with what others and in what positions the first beginnings of things are held in union, and what motions they do mutually impart and receive."

These views are extraordinary, and with the exception of the difference in the form of atoms, which is a point beyond what we have been able to reach even now, the above contains a very fair statement of the atomic theory which is held by the most advanced chemists to-day.

How Democritus could have reached such conclusions is a mystery, but his annunciation of these recondite truths very well illustrates the fact that an hypothesis, be it never so beautiful and even true, if unaccompanied by facts to support it, in no way helps the progress of natural science.

Like every other guess, it indicates merely the frame of mind of the man making it. It is like a floating shadow on the sea of time. Perhaps it defines substance, perhaps only a cloud of fancy.

This seed thrown off by Democritus found no soil of facts on which to grow from his time until late in the present century, although Gassendi, Canon, and Provost at Digne, in France, after ages of ignorance, proposed it again, but without proof; and it is thought to have influenced the minds of Newton and Boyle.

This, then, is one example of an occurrence in the history of the science which to all appearance neither helped nor obstructed its progress, unless in the indirect way of teaching men's minds to grasp large and comprehensive thoughts. All could not have been ignorance and degradation in Abdera (Thrace), or Miletus, or Athens, where a language existed capable of conveying from mind to mind thoughts like these, and where a mind was capable of conceiving such thoughts.

It teaches the student of natural history a lesson in addition to that of the old traveller's speculations, and it may serve to illustrate the difference which the late Prof. Clifford, of Cambridge, pointed out between accepting those conclusions of natural science which one has been taught but has not personally investigated, and accepting what is said to have been revealed, but which, it is acknowledged, is not susceptible of any proof. In the one case the way is open to any one to pursue any single direction which has been before taken, measuring and judging of the correctness of the steps of one's predecessor; but in the other case there is no path anywhere, and the correctness of the position assumed cannot be judged. It is the difference between, on the one hand, handing the keys of a hundred trunks to a custom-house inspector, who has at best time to examine but one or two, asking him to satisfy himself of the accuracy of your description; and, on the other, telling him that something indescribable ought to convince him more thoroughly of the contents of the trunks which he cannot inspect than of those which he can. Speaking generally, it may be said that a proposition of which the steps which led to its acceptance cannot be indicated and followed, has no place at all in the domain of science, though it may be true.

Such propositions were those of Democritus above given, and it is quite just that in the absence of logical proof they should have been excluded from the realm of science, and that to him who first showed reason for believing them should be accorded the honor of their discovery.

Of much less importance is the next hypothesis of the nature of things which we find annunciated by Aristotle in his quadrilateral of states: solid, fluid, dry (or warm), and moist (or cold), or what he supposed to be the elements of all bodies, viz., earth, air, fire, and water. It was unfortunate, and yet in accordance with the usual march of events, that this utterly inadequate and narrow guess should have fettered men's minds for 2,000 years, owing to the mighty hold which Aristotle took of all nations. (See Aristotle, "A Chapter from the History of Science," Lewes.)

As his historian remarks, Aristotle's works had a prodigious influence in Asia and Europe and Africa; among the Persians, Arabs, and in Germany, where part of his Ethics was read in the churches on Sundays instead of the Bible. In the middle ages, too, these elements of Aristotle were imbued with a mysticism more than Platonian.

It was the spirit of that middle age, when the ignorant classes, being the powers, made patient scientific work difficult and dangerous, that learning was concealed under the mask of paradox and cryptogram, as if it were a crime. Whatever Aristotle's view of his elements may have been, it took a new direction, beginning with Geber, in the eighth century.

The first chemists were alchemists, who sought the transmutation of base metals into gold—the philosopher's stone and the elixir of life. These were represented by Geber (an Arabian alchemist of 760), Albert von Bollstädt (1193–1280), Roger Bacon (1214–1294), Raymond Lull (1235–1315), Arnald de Villanova, Caletonia (1235–1314), etc.

Those who examined physical problems retained the Aristotelian view, while the alchemists took more or less

modified forms of Geber's doctrine that the metals were composed of mercury and sulphur. As an instance of the confusion which reigned in the ideas of this time, some believed that these constituents of metals were real sulphur and real mercury, while others believed that qualities were intended by these terms. Geber ascribed to the sulphur the property of giving different colors to the metals.

At the end of the fifteenth century the alchemists had added salt to mercury and sulphur. Many regarded the Aristotelian elements as the ultimate, and mercury, sulphur, and salt as the intermediate or proximate elements —as, for example, Basil Valentine, who extended the number of substances of which these were the ultimate elements from metals to all known matter, but denied that they were the common substances which we know under their names.

In the early part of the sixteenth century the failure to find the philosopher's stone led to the decadence of alchemistical or transmutation chemistry, and the rise of iatrochemistry, or that of healing. Paracelsus (1493–1541) taught that in a burning body the sulphur quality represented the inflammability, the mercury the sublimation, and the salt the ashes.

From this to the end of the seventeenth century disputes as to tenets were numerous, but no real progress was made. Agricola (1490–1555) attacked Paracelsus and fell back upon Aristotle. Libavius wrote the first treatise on chemistry (1595). Van Helmont (1577–1644) denied all Paracelsus' views and sought a universal solvent, which should be a panacea. He first recognized the existence of gases and quantitative relations, and opposed Aristotle's doctrines that fire was a body or earth an element, but believed water and air were such. Glauber (1603–1668), though possessing variable views, invented better means for separating bodies. Sumert (1572–1637), Willis (1621–1677), Lemery (1645–1715) believed in five first principles —mercury (spirit), sulphur (oil), salt, water (phlegma), and earth. Lemery taught that these were in rapid motion, and thus gave rise to the obvious properties of things. He explained the well-known phenomenon of the calxes of the metals weighing more than the metals themselves, by supposing that in burning they absorbed fire materials.

The real philosophy of chemistry commences with Robert Boyle (1622–1691), who denied the accuracy of the doctrines both of Aristotle and the later alchemical and iatro improvements upon them. He believed that heat had not the power to transform complex substances into their constituents, but, on the contrary, sometimes produced complex out of simple substances, and sometimes was without effect. Other agencies than heat could produce the same effects. He strongly denied that one could predict the number of simple substances, as Aristotle and his successors had done. He thought it probable, however, *that the so-called elements consisted of the same kind of matter*, differing only in the size, form, etc., of their respective smallest parts. (See Kopp's "Geschichte der Chemie") . . .

. . . Both by Boyle's destructions and by his conceptions he aided the progress of chemical theory as few have done since his time; and chemistry, or the study of the most intimate relations of matter, as distinguished from alchemy, magic, or the healing art, may fairly be said to have started with Robert Boyle.

Singularly enough, the first sapling to spring up and occupy the new clearing made by Boyle was an error so gross that it seems to the youngest student of to-day grotesque in its clumsiness; and yet, defended by some of the sublimest of sophists, it took one hundred years to overthrow it. And the most instructive part of its history is that it was finally overthrown by an argument which Boyle himself had employed—which had been employed by other sceptics, and explained away by the phlogistonists, and was ultimately and successfully refuted with the same experimental proof by a countryman of Boyle. It is often the case that an attack in front, over the very ground of numberless previous repulses, is successful, and it was the case here, as shall be briefly shown.

Stahl (1660–1734) was a physician of independent views, who adopted Becker's theory of combustion, or the changeability of bodies by heat. He believed that he had settled experimentally this question: "Is a common quality present in sulphur and carbon, or is one contained in the other?"

The generally accepted view at that time was diametrically opposite to that which Boyle held of combustion, and might be stated thus: Sulphur consists of oil of vitriol and some combustible body, which latter escapes in burning. Stahl combined oil of vitriol with an alkali, and, heating the combination with carbon, obtained an alkaline sulphide similar to that produced by sulphur and an alkali. From this sulphur (or vitriol) can be separated. Therefore the combustible in carbon and sulphur was the same.

Heating calxes of the metals with carbon, there resulted the metals. The metals were then composed of the calxes and this substance. Fats and oils produced the same effect with the calxes, and hence in them, too, was the same combustible substance.

Stahl called this combustible "Phlogiston."

This hypothesis was rapidly installed into the rights and dignity of a theory, and rallied around it as such some of the brightest minds for three generations.

It was not only faulty in its conclusions, but inadmissible in its steps, and should have incurred the opposition of every intelligent man who understood the limitations of inductive philosophy; but it occupied the vacant space left bare by the labors of Boyle, and, with a growth as luxurious as it was pernicious to the attainment of truth, obstructed in many ways all valuable advance of chemical theory while it lasted.

Magnesia as an Intensifier and Preservative of Peroxide of Hydrogen.

It was ascertained some time ago that when calcined magnesia is added to peroxide of hydrogen the bleaching action of the latter upon cotton is greatly intensified.

Prud'homme has recently studied this behavior, and has found that there is produced a peroxide of magnesium which is much more stable than the peroxide of hydrogen, even at a boiling temperature.

If a 6 volume peroxide of hydrogen is diluted with 10 parts of water, and then boiled for half an hour, its strength is reduced in the proportion of 100 to 10.

But if, under the same conditions, there are added 5 Gm. of calcined magnesia for every 100 parts of peroxide present, the half-hour's boiling will reduce the strength in H_2O only by one-tenth (from 100 to 90).

The formation of the peroxide of magnesium is rendered evident by proceeding as follows:

Place calcined magnesia [5 parts] in contact with a 3-volume peroxide of hydrogen [100 parts] at the ordinary temperature, and allow them to react for some time [the original says "from several hours to several days"]. Then filter, wash the contents of the filter, and dry at 100° to 105° C.

On assaying the product with permanganate of potassium, it will be found to have the composition $3Mg(OH)_2.MgO(OH)_2$. This compound loses its active oxygen at a temperature of about 300° C.

The bleaching effect of a mixture of magnesia and peroxide of magnesium is due to both agents acting together. When fatty substances, such as oils, are bleached by these agents at a boiling temperature, there is an abundant escape of carbonic acid gas, due to the oxidation of glycerin.

Peroxide of hydrogen alone, when very slightly acidified, is capable of attacking neutral fats, producing therefrom fatty acids under evolution of carbonic acid gas —After *Compt. Rend.*, 112, 1374.

[*Note by Ed. Am. Drugg.*—The facts above given may be utilized in surgical practice, in which peroxide of hydrogen is at present playing an important part as an antiseptic and disinfectant. The addition of magnesia will, in many cases, not be objectionable; and when it is desired to have the peroxide act rather slowly and gradually, no better method can be employed.]

The Catalogue of the Library of the College of Pharmacy of the City of New York is at present passing through the press, and will be ready for distribution to the members in about six weeks.

LABORATORY SUPPLIES.

In a recent number of the *Journal of Analytical Chemistry* (June, 1891), Mr. David H. Browne published a paper (annotated by G. W. White) giving hints to beginners in iron analysis. This contains some hints useful also to many of our readers. For this reason we reproduce certain portions of the paper, omitting those specially referring to the analysis of iron or iron ore.

It is supposed that a laboratory is to be fitted up in a place removed from the conveniences and comforts of large cities.

Source of Heat.—If coal gas can be had, this is, of course, preferable. When it is not available a small two-burner gasoline stove is used, under a hood. The gasoline tank is placed outside the partition, and connected with the burners by a pipe bent at right angles. The precaution of having the tank on the outside is necessary, since the fumes of evaporating acids would, in a very short time, attack the tin tank and perhaps cause a fire.

Sink.—This should be about eight inches deep and placed near the door. It should be of wood, not metal, as the latter would last only a short time under the corrosion of waste acids, while a wooden sink, made of pine plank, mortised, and screwed together with leaded joints, will last for years.

Water.—If running water can be had, so much the better. It often happens, however, that a pail with a faucet, standing on a shelf above the sink, is the only obtainable substitute.

Distilled Water, sufficiently pure for all ordinary (mine or furnace) analyses, can be obtained from a clean keg set under the steam-escape pipe. If the pipes have been some time in use, and no oil is mingled with the steam, this water is exceedingly pure. For more accurate work, however, this water should be redistilled.

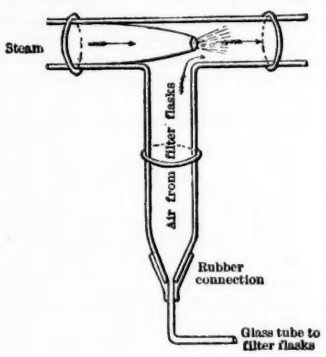


Fig. 1.

Fig. 3.

Fig. 1.—Filter Pump.
Fig. 2.—Stationary Siphon.

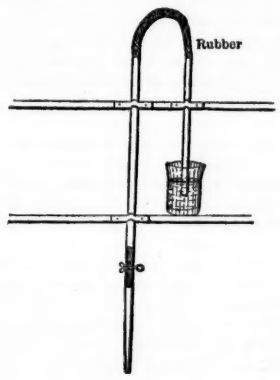


Fig 2.

Fig. 4.

Fig. 3.—Fork for Evaporating Dish.
Fig. 4.—The same seen from above.

Aspirator or Rapid Filter Pump.—A very good steam aspirator, much superior in cheapness and efficacy to any water-pressure pump I have seen in the market, can readily be made at any blacksmith shop. A piece of one-half inch iron pipe is drawn to a tapering point, the opening in which should be about one-eighth of an inch in size.

This pipe is threaded a couple of inches from the point, and screwed into a common branch or T-pipe, to such a distance that the point just barely passes the branch of the T.

By screwing another piece of pipe into the other end of the T, and a smaller piece into the branch, an aspirator is made which, with a very small amount of steam, will give a pressure equivalent to 10 inches of mercury. The construction of the aspirator can readily be seen by the accompanying diagram.

A glass tube leads from this aspirator to a salt-mouth bottle, from which diverging rubber tubes make connection with three filtering flasks. A mercury manometer, easily improvised from a glass tube bent double, and containing a foot or more of mercury in the bend, is connected with the salt-mouth bottle, and by a scale attached serves to show at a glance any variation of pressure.

Automatic Washing of Filters.—A stationary siphon attached to the shelves is often of great convenience in filtrations where pressure cannot be used. The sketch shows an easily adjustable form. By having a foot of rubber tubing forming the connection between the legs, the height of the shorter leg can be varied to suit the filtrate to be siphoned off. This is fixed above the aspirator, and is very quickly started by placing a beaker of distilled water under the shorter leg and connecting the longer with the aspirator till the apparatus is thoroughly washed.

The pinchcock is then closed, leaving the siphon full of water, and the filtrate desired can then be siphoned off.

When the operation is complete, a beaker of distilled water substituted for the filtrate washes out the glass tube and leaves the siphon ready for action again.

Gasoline Lamps for Ignitions.—In regard to gasoline lamps for ignitions and fusions, the most serviceable in the market is that known as the "New Laboratory" lamp, made by the Dangler Stove Mfg. Co., of Cleveland.

The flame is rather large, but is under immediate control, as far as heat and volume are concerned. A heat sufficiently high for burning graphite in silicon determinations is readily obtained with this lamp. For ignition of precipitates requiring a smaller flame, the Kellogg gasoline lamp gives a flame which closely resembles that of a Bunsen burner. This lamp is the most satisfactory for the ignition of small precipitates, such as $BaSO_4$ and $Mg_2P_2O_7$.

Glassware.—In selection of glassware and apparatus, it is always necessary to bear in mind the uses for which they are required. Each analysis should be studied, and the reagents and glassware required should be noted.

Haphazard selection from a catalogue of such apparatus as the analyst thinks ought to be bought, without regard to necessity, generally results in the purchase of glassware useful only to encumber the shelves of the laboratory.

Burettes.—For the common analyses two glass-stoppered burettes of 100 C.c. and two of 50 C.c. are required. These should be graduated to $\frac{1}{10}$ C.c.

It is always best to test burettes and make a table of corrections for every 5 or 10 C.c., thus:

Extremes. C.c.	Factor between these extremes.	10 C.c. =	Total value of max. reading.
0—10	0.997	9.97 C.c.	9.97
10—20	1.010	10.10 C.c.	20.07

An operator who thus checks his burettes will find increased confidence in results sufficient to repay the trouble. The best 100-C.c. burettes in the market are about 42 inches long; this length gives ample room for the small graduations to be read.

Burettes of large calibre are a mistake, as the markings are necessarily so close together that accurate reading is out of the question. Floats are, in the majority of cases, a waste of time, as with good burettes accurate reading can be made without them. Trouble is sometimes experienced from leaking or sticking of glass stoppers in burettes. In such cases time and temper are saved by cutting the stopcock off, and attaching a fine-drawn glass point to the end of the burette by a short rubber tube. A small plug of glass rod, to one side of which the rubber can be pinched, forms a valve more efficient and accurate than the glass stopper or pinchcock.

Filters.—The selection of filter papers is an important

consideration. The round-cut filters manufactured by Schleicher & Schüll have become very popular, as they are sold in all necessary sizes. The best style made by this firm for general work is known as No. 597. These are especially valuable for pressure filtrations, being very rapid and reliable. The No. 595 filter paper is slightly cheaper, but not so quick working nor as even in grade as the others.

Of the ashless or washed papers, that known as S. & S. No. 589 is most satisfactory. The ash of these can, in most work, be entirely disregarded. Filter paper No. 590 is a little lower in ash, but considerably dearer than 589. Since, however, the ash of a 589 filter of 9 Cm. in diameter is 0.00011 Gm., and that of a 590 paper of the same size is said to be 0.00008 Gm., the analyst can scarcely consider that a decrease of 0.00003 Gm. in ash (a weight beyond the capacity of the average balance to register) is worth the increase of 35 cents a hundred in the cost of the latter papers.

As to sizes of filter papers, the 9 Cm. No. 597 paper is most generally useful. This size is adapted for all such small precipitates as silica, lime, and magnesia in ores, and silica determinations in pig iron; while for alumina and lime in slags, where 1 Gm. is taken for analysis, the 12½-Cm. papers are quite large enough; and for very small precipitates, such as magnesium ammonium phosphate, the 7-Cm. size is required. For final filtration and ignition these sizes of ashless papers will be needed, unless the operator prefers in every case to deduct the weight of filter ash.

Funnels.—In ordering funnels care should be taken to obtain long-stemmed, ground-point funnels of an exact angle of 60°. It is astonishing how few funnels conform to this apparently simple requirement; yet this is absolutely essential for safe and satisfactory use in pressure filtrations.

For 12½ Cm. papers a 2¾-inch funnel is required, while a 9-Cm. filter requires a 2-inch, and a 7-Cm. a 1½-inch funnel. For such large filtrations as removing the zinc iron precipitate in Volhard's method, or for the final filtration of molybdate solution in Emmerton's titration of phosphorus, a 25-Cm. E. & A. German white or a Prat-Dumas paper is necessary. These should be folded, ribbed, and used in a 5¼-inch funnel. At some steel works the gray Prat-Dumas paper is used exclusively for such work, and is very rapid, with the added merit of cheapness.

Platinum Cones.—For pressure filtrations two or three platinum cones, one inch in diameter, will be needed. Spun cones should be used, as the split cones made from platinum foil are liable to get out of angle and tear the paper.

Forks for Evaporating Dishes.—A fork in use at many of the larger laboratories for handling evaporating dishes, is made by bending a piece of heavy telegraph wire into the shape shown in the cut. This fits easily around a dish, and is invaluable where much evaporation is done.

A NEW SHAKING APPARATUS.

O. GUESSEFELD, of Hamburg, describes a new shaking apparatus which may serve a good purpose in many analytical operations, such as the assay of superphosphates, opium, etc.

In a frame, *a* (see cuts on opposite page), consisting of a bottom board with two lateral uprights carrying the axle *c*, there is a crank shaft, *e*, setting in motion the rod *d*, which is itself connected with an arm through which the axle *c* passes. The end of this arm can be made to clamp a flask which has been placed in a holder, *b*. The several parts, *d* and *b*, are shown, in different positions, in the smaller cuts. Rotary motion is produced by means of a grooved pulley, *f*, connected by means of a round belt with a motor. In want of the latter it may be connected with the spindle *g*, to be worked by hand.—*Zeitsch. f. angew. Chem.*

Wood Pulp as Absorbent.—For the purpose of rapidly drying filters and various preparations, discs or plates of wood pulp are recommended by Paul Hartmann. These discs may be coated with cellulose, whereby they become smoother. They soak up liquid more readily than plates of clay or gypsum.—After *Zeitsch. f. anal. Chem.*

Methods of Ascertaining the Limits of Impurities in Pharmaceutical Chemicals.*

BY PROF. CHARLES O. CURTMAN, OF ST. LOUIS.

WHEN we wish to employ chemical preparations as reagents for the purpose of detecting the presence or absence of certain chemical elements or compounds, we have to convince ourselves first that they are absolutely free from admixture of even the smallest traces of the substances which we are searching after, or of such as might interfere with the expected reactions. Thus, when we desire to ascertain the presence or absence of arsenic by any of the methods which convert it into arsenetted hydrogen, our sulphuric or hydrochloric acid, as well as our potassium or sodium hydrate, or zinc or aluminium or magnesium, must first of all be proven by the strictest tests to be themselves free from the least trace of arsenic. When we wish to employ sulphuric acid as one of the reagents for the detection of nitrates in potable waters, it is necessary that it be absolutely free from even traces of nitrose (under which name the various oxides of nitrogen are comprised).

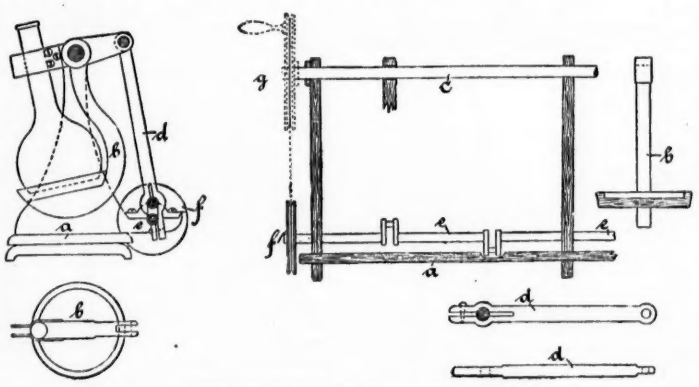
Such testing for absolute purity is comparatively easy, and we get, by the use of suitable reagents, at once a definite answer to the question whether the impurity is present or not. It is far otherwise in the case of a number of pharmaceutical chemicals. For when a chemical preparation is intended to serve for medicinal purposes, it is not always required to strictly exclude all impurities. For there are some which, when present in small amount only, cannot possibly do any harm, while their perfect removal from the preparation would materially increase the cost of manufacture. Thus, for instance, not even the greatest stickler for the purity of remedies could reasonably object to the presence of a trace of chloride or sulphate in the acetate of sodium, or to the presence of a trifle of carbonate of magnesium in prepared chalk. Yet while small amounts of impurities derived from the raw materials, which only very troublesome and expensive processes of purification could remove, might be suffered to remain, it would be very injudicious to leave such amount to the option of the manufacturer. Hence the pharmacopœial standards direct in such cases a limit beyond which such admixture with foreign substances may not extend. This permission, however, to let a certain amount of harmless impurities remain in the finished product, while it relieves the manufacturer, makes the task of chemical examination a much more difficult one. For to show absolute purity it suffices to add the reagent, and observe that it produces no result; while in the case of a limited amount of impurities being allowed, we have to show that the impurity indicated by the reagent does not exceed the authorized amount. In other words, mere qualitative examination no longer suffices, and quantitative analysis must be resorted to. The methods adopted to ascertain whether the quantity does or does not come within the prescribed limit should be such that any skilled pharmacist could execute them without great loss of time, and without having at his command the special apparatus and the special experimental training of the professional analyst. Hence the more elaborate quantitative methods should, where possible, be replaced in the Pharmacopœia by those which are at once of sufficient approximation to accuracy, and yet capable of easy and rapid execution. For this purpose two methods appear to be especially adapted. First, the employment of reagents possessing different degrees of sensitiveness for the same substances. Secondly, the addition of a definite proportion of a standardized solution of a reagent, to remove by precipitation a corresponding amount of the suspected impurity up to the limit allowed, and the subsequent testing of the filtrate by an additional amount of the same reagent, when the occurrence of any visible change would indicate the presence of more than the permitted limit of impurity. Each of these methods may prove useful in pharmacopœial testing, and secure results with sufficient accuracy and promptness to answer every purpose.

The better to explain the meaning, a few examples of each method will be given. We may employ for the de-

* Paper read at the annual meeting of the Missouri Pharmaceutical Association.

tection of a certain impurity a reagent whose sensitiveness only extends to a limited percentage, and beyond that fails to give any characteristic indications. This may be due either to the fact that the product of the reaction, being a solid, not quite insoluble, will dissolve in an excessive amount of liquid and cease to be visible, or the reaction may fail to take place entirely or be delayed for some length of time. When such a reagent indicates the presence of an impurity at all, it also shows that the quantity of this impurity either equals or exceeds that which is required to produce a visible change. Sometimes we have different reagents for the same substance, which vary in degree or delicacy, and may be employed to show the presence of different quantities.

Thus we may precipitate potassium salts by an excess of tartaric acid, when crystalline bitartrate of potassium will form. But if the amount of potassium be less than one-tenth of 1 per cent of the solution containing it, no precipitate is formed, as there is liquid enough to keep the bitartrate of potassium in solution, and the limit of the reaction is therefore reached. An addition of a concentrated solution of platinic chloride, which is capable of detecting about one-twelfth of 1 per cent of potassium in watery solution, would prove a slightly more sensitive reagent than tartaric acid. But when dilution goes still beyond this proportion, so that both tartaric acid and platinic chloride have failed, we possess in the sodium-cobaltic nitrite a still more delicate reagent, which will promptly form a copious yellow precipitate in an aqueous solution — one-twentieth of 1 per cent of potassium. In even greater dilutions precipitates are formed more slowly, until they cease to distinctly form. The potassium amounts to less than one-thirtieth of 1 per cent. In cases where the addition of alcohol is not objectionable, all three of the reagents produce precipitates with still smaller amounts of potassium, as they are less soluble in dilute alcohol than in water. By employing one or the other of these reagents we have, therefore, means of grading the limit of potassium occurring as an impurity in the salts of other bases.



Guessefeld's Shaking Apparatus (see page 232).

In a similar manner we may mention reagents which show the presence of arsenic with a different degree of delicacy. Thus Bettendorff's test with stannous chloride fails to give satisfactory evidence when much less than 0 1 Mgm. of arsenic trioxide is contained in 1 C.c. of the solution. So that chemicals in which the presence of so small a percentage of arsenic is not objectionable may be tested by this method and rejected when the reaction occurs, but deemed sufficiently pure for medical use when there is no brown color produced by the reagent. Ammoniacal silver nitrate in Hume's test will go much further, and gives a fairly perceptible reaction (a yellow precipitate) in a solution containing only 0.02 Mgm. of arsenic trioxide in 1 C.c. Hydrogen sulphide gas passed through the acidulated solution will detect 0.01 Mgm. Gutzeit's modification of Marsh's test gives an unmistakable reaction with 0.001 Mgm. of arsenic in 1 C.c. of solution, and even enables us by very careful attention to recognize 0.0001 Mgm. Hence when, as is the case with most of the pharmaceutical chemicals, a percentage of arsenic as small as one-tenth Mgm. in 1 C.c. of a solution containing 1 Dgm. of the substance to be tested, or 1 part in 100,000 parts (less than 1 grain in 200 ounces), is not objectionable, a negative result with stannous chloride suffices to mark the limit of the impurity. When, however, absolute purity is demanded, as is the case with most reagents, we must show that even the delicate test of Gutzeit will fail to show any reaction.

In a similar manner ferrocyanide of potassium (the yellow prussiate) may serve as a reagent which will detect iron within certain limits. With ferric salts in neutral or acidulated solutions, the reagent will produce a blue precipitate of such intensity of color that even very minute amounts can be recognized. But when the dilution becomes too great, the blue compound (Prussian blue) is not seen at once, but requires some time for its formation, especially if only a small amount of the test solution be added. Hence a very minute amount of iron, such as may be allowed as a limit, will not produce the blue color within less than fifteen minutes, if only one-half cubic centimeter or less of the ferrocyanide test solution is added. A chemical showing the reaction in a shorter time must contain a greater percentage of iron than is admissible, and should be rejected.

The second method of ascertaining whether a given limit of impurity is exceeded or not is still more generally applicable than the first, of which the testing for potassium and for arsenic has been cited as examples. In testing chemicals for impurities—such as, for instance, the presence of chlorides or sulphates in salts, which should contain them only in minute quantities, or not at all—the direction generally reads that, on addition of silver nitrate, no more than "a faint opalescence" or "a slight turbidity" should appear; or that the addition of barium chloride should produce only "a light cloudiness" or a "scant precipitate," etc. All of which appearances, being somewhat difficult of exact grading of intensity, leave a considerable scope of uncertainty in the decision whether a certain chemical comes just within the limit of permitted impurity, or exceeds it to a greater or less extent. Instead of this vagueness of estimation it would be far better to settle on a definite percentage of impurity to be allowed, and then ascertain that the amount is not exceeded by adding the exact quantity of a reagent required to remove such percentage of impurity by precipitation. After filtration, no more visible change should then be produced by an additional amount of the reagent. Thus we will assume that the presence of one-half of 1 per cent of sodium chloride be the limit of that impurity permitted in acetate of sodium. To find out whether a certain specimen conforms to this demand, we dissolve 0.584 Gm. of the acetate in 10 C.c. of water, and add to it a few drops of nitric acid, and then 0.5 C.c. of the decinormal solution of silver nitrate. If no precipitate, turbidity, cloudiness, or opalescence appear, we need go no further, for the entire absence of chloride is proven. But if a precipitate does occur, we shake the solution vigorously to collect the precipitate into coherent flakes, and then filter. The amount of silver nitrate added is sufficient to precipitate exactly 2.92 Mgm. of sodium chloride, amounting to one-half of 1 per cent of the 0.584 Gm. of sodium acetate tested. Hence, one-half of 1 per cent, or any quantity less than that, of sodium chloride would be removed from the solution, and a preparation containing no more impurity would yield a filtrate in which no subsequent addition of silver nitrate could produce any visible change. Should such a change occur in the filtrate, from our specimen, on the addition of silver nitrate, it would be evidence of the presence of a larger amount of impurity than the limit allowed, and the preparation must be rejected.

In like manner a definite amount, say one-half of 1 per cent, of sulphate may be precipitated, if we add 0.1 C.c. of normal barium chloride volumetric solution to 1.42 Gm. of sodium acetate dissolved in a mixture of 25 C.c. of water with 5 C.c. of hydrochloric acid. The presence of the

acid renders the precipitated barium sulphate more granular, so as not to pass through the filter; in the filtrate no further change should be perceived on addition of more barium chloride solution. In selecting sodium acetate and assuming a limit of one-half of 1 per cent of either impurity to be admissible, the writer does not wish to imply that the presence of a somewhat larger amount could not be allowed without producing serious results, but simply desires to exemplify in this salt the method of a prompt testing; for a correct limitation of impurities is quite definite, leaving no room for uncertainty in the estimation of the greater or less amount of cloudiness or turbidity. Yet it can be easily accomplished by any one possessed of ordinary skill in pharmaceutical manipulation, without demanding either special training in analytical work or complicated apparatus.

The quantities of any salt to be tested for a certain percentage of impurity are easily ascertained, and are of equal amount for any salt of the same base, no matter with what acid it may be combined, for the same number of cubic centimeters of the reagent employed to precipitate a certain impurity.

In the case of chlorides we find that 1 C.c. of decinormal solution of silver nitrate precipitates:

0.00744 Gm. of potassium chloride.
0.00584 Gm. of sodium chloride.
0.00554 Gm. of calcium chloride.
0.00534 Gm. of ammonium chloride.
0.00424 Gm. of lithium chloride.

Hence, to precipitate by 1 C.c. of the silver solution 1 per cent of chloride, in the salts of the above bases, there must be used:

0.744 Gm. of any potassium salt.
0.584 Gm. of any sodium salt.
0.554 Gm. of any calcium salt.
0.534 Gm. of any ammonium salt.
0.424 Gm. of any lithium salt.

If we wish to precipitate one-half of 1 per cent of chloride, we must either take only 0.5 C.c. of the silver solution, or use double the quantity of the salt to be tested, and so on for any different percentage we desire to adopt.

In the same manner we calculate the proportions for the precipitation of sulphates by barium chloride. As this reagent is generally used in normal solution, which is tenfold more concentrated than the decinormal solution, 0.1 C.c. corresponds in strength to 1 C.c. of decinormal solution; 0.1 C.c. of normal barium chloride (containing 103.7 Gm. of $BaCl_2$, or 121.7 Gm. of the crystallized salt, $BaCl_2+2HO$, in 1 liter) precipitates:

0.0087 Gm. of potassium sulphate.
0.0071 Gm. of sodium sulphate.
0.0068 Gm. of calcium sulphate.
0.0066 Gm. of ammonium sulphate.
0.0055 Gm. of lithium sulphate.

Hence, to precipitate, by means of 0.1 C.c. of normal barium chloride, 1 per cent of sulphate, the following quantities of the salts of the above bases must be used:

0.87 Gm. of any potassium salt.
0.71 Gm. of any sodium salt.
0.68 Gm. of any calcium salt.
0.66 Gm. of any ammonium salt.
0.55 Gm. of any lithium salt.

For more or less than 1 per cent, less or more in proportion of these quantities must be used—double the quantity for one-half of 1 per cent, four times the quantity for one-quarter of 1 per cent, etc.

In a similar manner we can use lime water for the precipitation of carbonate in caustic potassa or soda. After boiling a certain number of cubic centimeters of the lime water with solution of a definite weight of potassium or sodium hydrate, until the amount of calcium carbonate, formed from the alkaline carbonate and the lime water, is separated in granular form, we filter. In the clear filtrate acids no longer cause any effervescence, if the amount of carbonate was within the limits allowed. The method is sufficiently accurate for approximation only, for the lime water, when saturated near 15° C. (59° F.), is very nearly $\frac{1}{75}$ of the strength of normal solutions, but at higher temperatures becomes weaker, by depositing calcium hydrate, which is much more soluble in cold than in warm water. The new German Pharmacopœia adopts this method for limiting the amount of carbonate in caustic potassa, and it is applicable to other preparations as well.

Modifications of the processes here described will serve for ascertaining whether the limit of impurity permitted by the Pharmacopœia is exceeded or not in many other preparations, *e.g.*, for magnesium in calcium salts, for calcium in the salts of sodium or potassium, etc. It is to be hoped that greater certainty in results, combined with great facility in execution, will make testing of the chemicals purchased more general among the members of the profession.

Ointment for Hæmorrhoids.

℞. Hydrochlorate of Cocaine..... gr. xvi.
Sulphate of Morphine..... gr. v.
Sulphate of Atropine..... gr. iv.
Powdered Tannin..... gr. xvi.
Petrolatum..... ℥ i.
Essence of Rose..... q. s.

Make an ointment and apply to the affected parts after each movement from the bowels. It is necessary that the discharges be of soft consistence.—*Journ. Amer. Med. Assoc.* [It appears to us that the proportion of atropine is too large to be safe.—ED. AMERICAN DRUGGIST.]

Muawine, a New Alkaloid.—Muawine is the name given to an alkaloid contained in the muawi tree, which is found in Mozambique. The rind of the tree is supposed to possess similar tonic proprieties to the sassy bark (*Erythrophlœum guineense*), but is quicker and more powerful in its action. The free alkaloid is amorphous and syrup-like, readily soluble in alcohol, ether, and chloroform, and closely resembling erythrophlœine. None of the salts have been obtained in a crystalline condition. The hydrobromide is a white powder, soluble in water, alcohol, and chloroform. The physiological action of muawine is similar to, but not identical with, that of erythrophlœine.

Unalterable ("Excel") Milk.—It will be of general interest to learn that there is a process, already in successful operation, by which cow's milk is perfectly preserved for almost any length of time. Of course, it depends upon its being absolutely sterilized, and kept so that access of bacteria or germs is absolutely prevented. The process appears to have been in successful operation for some years, though it does not seem to have attracted attention in public. There is no doubt that it will soon be worked in this country. A brief account of it has recently been given by the editor of the *Chemist and Druggist*.

It is the process of Messrs. Neuhauss, Gronwald & Oehlmann, of Berlin, which is employed, and the bottle is part of the scheme. This is a shoulderless bottle fitted with a porcelain and rubber stopper, which is attached to the neck of the bottle by two wires so tent that when the lower one is pressed down it pulls the stopper "home" and keeps it perfectly air- and water-tight. In sterilizing milk, the bottles are filled, placed in wire baskets and then in a chamber where jets of steam bring the temperature up to blood heat. The baskets are now transferred to a large square copper which has a lid that fits securely to it. This is lowered, clamped, and steam turned on, and in a few minutes a thermometer indicates 100° C. as the temperature of the contents of the bottles. At this it is kept for twenty-five minutes, which experience has proved to be more than enough to completely sterilize the milk.

Steam is cut off now, and by an ingenious arrangement a number of cross-bars within the lid of the copper are actuated from the outside so as to press down the springs of the stoppers, so that the bottles are closed before the copper is opened. It will be seen, therefore, that there is no possibility for any microbic life to survive the steaming, nor can a germ get into the milk again until it reaches the consumer and the bottle is opened.

Milk for steamers is also sterilized in tin vessels, from which it is run into sterilized cans after the prescribed time. Even in these cans the milk keeps its sweetness for many months.

SOXHLET'S NEW IMPROVED DRYING OVEN.

EVERY drying oven so far constructed is affected with material drawbacks, chief among which are: irregularity of temperature in different parts of it; inefficiency of air as a conductor of heat; and insufficient draught.

Prof. Soxhlet has succeeded in devising an apparatus in which these defects are very materially reduced, so much so that the determination of milk solids, which heretofore consumed (with the Adams coil) from three to four hours, has been reduced to twenty minutes.

Moreover, the attainment of absolute dryness (constant weight), in the case of numerous substances, can, with the new apparatus, be ascertained by mere inspection, and it is even feasible to have this point indicated by an alarm.

The drying *space* (in the oven) is 47 Cm. (18½ inches) long, 9.5 Cm. (3¾ inches) wide, and only 3 Cm. (1$\frac{3}{16}$ inches) high. At all sides, except the small door, it is surrounded by a boiling solution of common salt. In the lower part of the outer box (containing the solution) are 8 brass tubes of 15 Mm. (about ⅝ of an inch) diameter, which convey air from the outside to the drying space proper (see Fig. 2). The only place which is not touched by the boiling solution is the small door, a piece of wood covered with felt, held in place by a feathering spring. Immediately behind this door, a short tube, 40 Mm. (1½ inches) in diameter, is soldered into the upper walls of the box, communicating with the interior. This serves as draught chimney, and may be rendered still more effective as such by lighting a small gas flame contained in it, a mica-glazed door being provided for lighting the flame and watching its size. By means of this arrangement, about 10 cubic meters of air, heated to the temperature of the boiling salt solution, are drawn every hour through the oven. At the same time the draught is so gentle that even the lightest powder, when dry, will not be disturbed. A special box or case is attached in front of the chimney for the insertion of a thermometer, which need or should not reach more than a few millimeters down into the drying space. The flame in the chimney should be about 5 Cm. (2 inches) high. In order to maintain a uniform concentration of the salt solution, a globular condenser is attached to the other end of the surface of the apparatus [in Fig. 1 this globular condenser, B, is supposed to be at A; why it is transferred to an additional apparatus, as shown in the cut, will appear further on], and a glass gauge shows the level of the solution. When charging the apparatus, a cold-saturated solution of common salt, which boils at 107° C., is poured in to a mark attached at the rear wall, behind the glass gauge. As source of heat, an ordinary Bunsen burner may be used. Care must be taken that the globular condenser is properly fed with cold water, which may be from a regular water service, by means of rubber tubing attached to the projecting necks, and the glass gauge must be from time to time inspected.

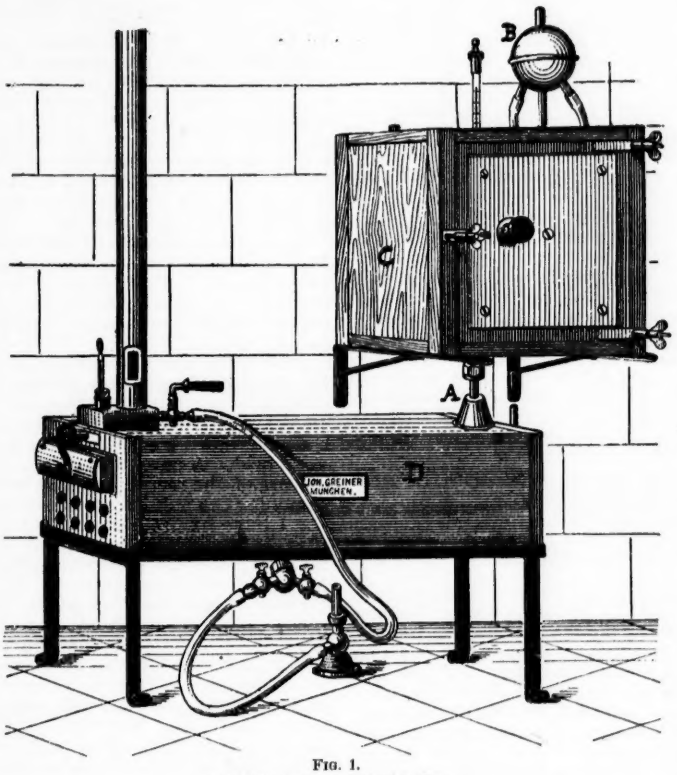


FIG. 1.
Soxhlet's Improved Drying Oven.

The best-shaped vessels for drying substances in this apparatus are flat-bottomed nickel or glass capsules of 9 Cm. (3½ inches) diameter and 10 Mm. (⅜ inch) height. During weighing the glass capsule is covered with a glass plate, and the nickel capsule with a nickel cover, the margin of the cover being turned down. In nickel vessels drying proceeds more rapidly, and they are, moreover, preferable on account of their lighter weight. A small, long-armed shovel is used for introducing or removing them.

Instead of attaching the globular condenser to the drying oven, the latter may be further connected with a double-walled drying box of the kind so universally in use, and the condenser then attached to the latter. This affords an additional drying space, suitable for drying filters, extraction flasks, etc., the temperature in it being quite uniformly about 94° to 95° C.

When it is desired to cool off a capsule very rapidly, this may be accomplished by artificial cooling. To prevent access of moist air, the capsule is covered with a soft rubber plate weighted down by a glass plate. It is then placed on a cold metallic block, where it will cool rapidly. Or it may be put on the ring of a retort stand, and a fine spray of ether played upon its bottom. After being wiped it may be weighed, and no material error will be committed.

The proportions and dimensions given above for the shape and size of the apparatus are those which have been found to be the most advantageous in practice. Prof. Soxhlet has used it exclusively for two years, and has found it preferable even to a vacuum drying apparatus.

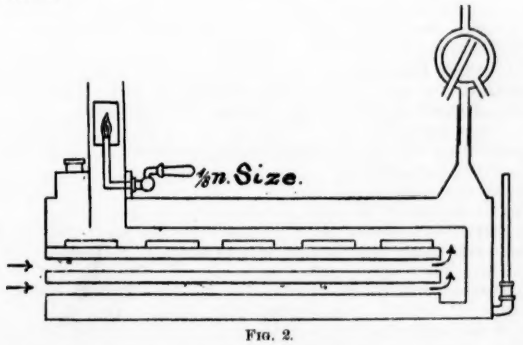


FIG. 2.

As long as there are moist vapors given off by any substance introduced for drying, the highest temperature which the thermometer would very uniformly show, if the drying space were empty, is not fully reached.

The introduction of a moist substance depresses the temperature, and the latter returns to its normal high stand only when the substance is dry. It is, therefore, easy to judge of the progress of drying by watching the thermometer. The following example is quoted by Prof. Soxhlet to show the progress of drying:

Five capsules, each containing 7 Gm. of powdered pumice and 5 C.c. of milk, were placed in the drying chamber and the door immediately closed. The thermometer then indicated the following successive temperatures:

After	3 minutes	94° C.
"	6 "	95° C.
"	8 "	96.2° C.
"	10 "	97.2° C.
"	12 "	100° C.
"	14 "	101.3° C.
"	15 "	102° C.
"	16 "	102.4° C.
"	17 "	102.8° C.
"	18 "	103° C.

After the temperature of 103° C. had been attained, which was the highest at which the oven had stood while it contained the empty capsules, the five samples were taken out, cooled in the exsiccator, and weighed. They were then again dried for another hour, and again weighed. The difference was not more than a plus or minus of a fraction of a milligramme.

Many other experiments have proven that when the highest point of temperature has been attained the substance has become perfectly desiccated.

By inserting a so-called contact thermometer—with adjustable electric contact—instead of a common one, and connecting an electric alarm with it, the proper moment when a state of dryness has been attained may be announced, thus doing away with the necessity of watching the apparatus.

The manufacturer of the apparatus is Johannes Greiner, of Munich. It may be procured through any of the importers of chemical apparatus (see advertising columns).

A Chemical Fire Alarm.

A NEW fire alarm now in use in Sweden consists of a small copper cartridge closed by an india-rubber button and filled with a fire composition. The fuse contains a mixture of potassium chlorate and sugar, and on it is placed a paraffin capsule containing a few drops of sulphuric acid. When the temperature of the room rises above the melting point of paraffin the sulphuric acid is liberated and ignites the chlorate mixture, which in its turn sets fire to the Bengal light.

A fusible metal disc, placed in contact with the mixture, will also be melted, and thus make electrical connection with a call bell so as to sound the alarm at a distance.

How to Loosen Glass Stoppers.

THE *Pottery and Glassware Rep.* states that some one of the following methods is certain to prove effective:

1. Hold the bottle or decanter firmly in the hand or between the knees, and gently tap the stopper on alternate sides, using for the purpose a small piece of wood, and directing the strokes upward.

2. Plunge the neck of the vessel in hot water, taking care that the water is not hot enough to split the glass. If the stopper is still fixed, use the first method.

3. Pass a piece of lint around the neck of the bottle, which must be held fast while two persons draw the lint backward and forward.

4. Warm the neck of the vessel before the fire, and when it is nearly hot the stopper can be removed.

5. Put a few drops of oil around the stopper where it enters the glass vessel, which may then be warmed before the fire. Then apply process No. 1. If the stopper still continues immovable, repeat the above process until it gives way, which it is almost sure to do in the end.

6. Take a steel pin or needle and run it round the top of the stopper in the angle formed by it and the bottle. Then hold the vessel in your left hand and give it a steady twist toward you with the right, and it will very soon be effectual. If this does not succeed, try process No. 5, which will be facilitated by it.

On "Patent" Medicines.

THE following is taken from a paper by Dr. John S. Billings, prepared for the celebration of the centennial of the American patent system:

The application of the patent system to medicine in this country has had its advantages for certain people, has given employment to a considerable amount of capital in production (and to a much larger amount in advertising), has contributed materially to the revenues of the Government, and has made a great deal of work for the medical profession.

So far as I know, but one complete system of medicine has been patented in this country, and that was the steam, cayenne pepper, and lobelia system—commonly known as *Thomsonianism*—to which a patent was granted in 1836. The right to practise this system, with a book describing the methods, was sold by the patentee for twenty dollars, and perhaps some of you may have some reminiscences of it connected with your boyish days. I am certain I shall never forget the effects of "Composition Powder," or of "Number Six," which was essentially a concentrated tincture of cayenne pepper, and one dose of which was enough to make a boy willing to go to school for a month.

From a report made by the Commissioner of Patents in 1849, it appears that eighty-six patents for medicine had been granted to that date; for the specifications of most of those issued before 1836 had been lost by fire. The greater number of patents for medicines were issued between 1850 and 1860.

The total number of patents granted for medicines during the last decade (1880–1890) is 540. This, however, applies only to "patent medicines," properly so-called, the claims for which are, for the most part, presented by simple-minded men who know very little of the ways of the world. A patent requires a full and unreserved disclosure of the recipe, and the mode of compounding the same, for the public benefit when the term of the patent shall have expired; and the Commissioner of Patents may, if he chooses, require the applicant to furnish specimens of the composition and of its ingredients, sufficient in quantity for the purpose of experiment. The law, however, does not require the applicant to furnish patients to be experimented on, and this may be the reason why the Commissioner has never demanded samples of the ingredients. By far the greater number of owners of panaceas and nostrums are too shrewd to thus publish their secrets, for they can attain their purpose much better under the law for registering trade marks and labels, designs for bottles and packages, and copyrights of printed matter, which are less costly and do not reveal the arcanum.

These proprietary medicines constitute the great bulk of what the public call "patent medicines."

The trade in patent and secret remedies has been, and still is, an important one. We are a bitters- and pill-taking people. In the fried-pork and saleratus-biscuit regions the demand for such medicines is unfailing, but everywhere they are found.

I suppose the chief consumption of them is by women and children, with a fair allowance of clergymen, if we may judge from the printed testimonials. I sampled a good many of them myself when I was a boy. Of course, these remarks do not apply to bitters. One of the latest patents is for a device to wash pills rapidly down the throat.

I am sorry to say that I have been unable to obtain definite information as to the direct benefits which inventions of this kind have conferred on the public in the way of cure of disease or preventing death. Among the questions which were not put in the schedules of the last census were the following, namely: "Did you ever take any patent or proprietary medicine?" "If so, what and how much, and what was the result?"

Some very remarkable statistics would no doubt have been obtained had this inquiry been made.

I can only say that I know of but four secret remedies which have been really valuable additions to the resources of practical medicine, and the composition of all these is now known.

These four are all powerful and dangerous, and should only be used on the advice of a skilled physician.

Crystallization and Crystallizing Media.

WHEN organic proximate principles are to be obtained in a crystalline form, they are either dissolved in the hot menstruum to saturation, so that the dissolved substance crystallizes out on cooling, or the solution is allowed to evaporate spontaneously. Besides these two methods, sublimation is also used for obtaining crystals. These three are the methods most generally employed for organic compounds.

Among the solvents or menstrua more commonly used are the following: Water, hydrochloric acid (nitric acid), sulphuric acid. Acetone, ether, alcohol and its homologues (amyl alcohol, etc.); also methyl alcohol. Also mixtures of alcohol and water in various proportions. Aniline (also ammonia). Benzol and its homologues. Toluol, xylol, cumol, and chloroform. Glacial and common acetic acid, acetic ether. Petroleum ether, phenol. Carbon disulphide.

In some special cases the following have been employed: Hydrochloric acid, glycerin, creosol, naphthalin, nitrobenzol, petroleum, phosphorus oxychloride, pyridine, turpentine, spermaceti.

Regarding the best methods of using some of these solvents as crystallizing media, a few practical hints may be given here.

Water.—If water is used for recrystallizing substances affected by the air—for instance, such as become colored by exposure to it (as is the case with many amines)—a little carbon disulphide or sulphurous acid is added to the water.

Hot Hydrochloric Acid is very useful when the object is to leave behind resinous matters, which it does not dissolve. Thus, when paranitrophenol is to be separated from the accompanying resins, this solvent is used.

Ether sometimes, though very rarely, forms a constituent of crystals. Thus, pseudo-leucaniline was obtained by Fischer and Ziegler in crystals containing ether.

When ethereal solutions are to be evaporated so as to obtain the dissolved substance in crystals, it is advisable to treat the solution first with chloride of calcium, in order to remove the moisture or water which will adhere to the crystals after the ether has evaporated.

Alcohol.—Graham was the first who observed that alcohol could be a constituent of a crystal. And Hesse seems to have discovered the only substance—viz., conchairamine, an alkaloid of cinchona bark—which contains both water and alcohol when crystallized ($C_{22}H_{26}N_2O_4.H_2O.C_2H_6O$).

Benzol is also capable of forming a constituent of crystals; sometimes it is so firmly combined that it requires protracted heating at over 100° C. to dissipate it.

Chloroform behaves similarly. Thus, the triazin of benzol ($C_{27}H_{18}N_6$) crystallizes with 1 molecule of chloroform, the alkaloid colchicine with 2 molecules, etc.

Glacial and Ordinary Acetic Acids.—If these have been used as solvents and crystallizing media, the crystals are freed from the adhering liquid either by allowing the latter to evaporate over caustic potassa in a desiccator (without rarefying the air), or by drying them in a current of air at 100° C. or over soda-lime in vacuo.

Naphthalin has once served a good purpose. Witt could not obtain one of the varieties of naphthazin in a crystalline form by using any of the methods then known. He finally succeeded by dissolving the substance in boiling naphthalin, allowing to cool slowly, and then boiling the solid mass repeatedly with alcohol, which gradually dissolved the naphthalin, but left the naphthazin behind in form of crystals.

Petroleum-Ether.—The most serviceable is that which boils at 60° to 70° C. on a water bath.

Phenol is an excellent solvent for many substances. By means of it Witt succeeded in crystallizing eurhodol, which is insoluble in *all* other known solvents. He dissolved the hydrochlorate of eurhodol in hot phenol, then cooled to 100° C., and added boiling alcohol to which a little aniline had been added. The aniline combined with the hydrochloric acid, and the eurhodol then crystallized in needles.

"*Salting out.*"—In many cases a substance may be caused to separate from an aqueous solution by dissolving in the latter certain substances which throw the other out of solution. Such substances are chloride or sulphate of sodium, potassium carbonate, etc. Thus, alcohol may be separated from water by saturating the mixture with potassium carbonate. The alcohol will then form a layer on top of the aqueous solution.

In the case of alcoholic solutions, addition of water will often effect this. [Of course, not every substance thus separated can exist in a crystalline form.]

Ethereal solutions are cautiously treated with petroleum-ether until the mixture begins to look turbid. The substance will then soon begin to separate.

In the same manner bodies may be thrown out of solution in other cases, for instance, by adding alcohol to phenol solutions, etc.—LASSAR-COHN in *Arbeitsmethoden f. organ.-chem. Laboratorien.*

Pepsin Unaffected by Boric Acid.

IN view of the extending use of boric acid and several of its compounds for the preservation of food, precise information as to its action upon the animal body is exceedingly desirable.

While Leffman and Beam (*Analyst*, xiii., 103) have found that boric acid has practically no influence on the diastasic action of malt extract, and, presumably, also upon that of the saliva, Gorup-Besanez ("Lehrbuch d. physiol. Chemie," p. 45), a high authority, states that a solution of borax, whilst without influence upon organized ferments, renders non-organized ones inactive.

In order to put these conflicting statements to the test, as regards pepsin, I charged twelve [13?] bottles each with 50 Gm. of hard-boiled white of egg which had been rubbed through a very fine sieve, added 250 C.c. of water containing 0.15 per cent of hydrochloric acid, and 0.34 Gm. of pepsin which had been previously ascertained to be capable of completely dissolving 2,500 times its weight of albumen in about five hours at a temperature of 40° C.; 0.033 Gm. of pepsin was, therefore, capable of dissolving completely 82.5 Gm. of albumen.

To bottle No. 1 no further addition was made; to the other eleven [12] the following quantities of pure boric acid were added: 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0, 1.5, 2.0, 2.5, and 3.0 Gm. All the bottles were then plunged into a water bath and kept at a temperature of 40° C., with frequent shaking. The albumen dissolved equally well in the whole of the bottles, and after about five hours solution was complete in all the samples. There was no difference whatever between the action of pure pepsin and that charged with as much as 3 Gm. of boric acid. I conclude that boric acid, even in the amounts used, has no retarding influence upon peptic digestion.—OTTO HEHNER in *The Analyst*, 1891, 126.

Bromide of Bismuth.

THIS salt has several times been experimented with by physicians of our acquaintance. Small quantities of it were prepared for their use by allowing powdered bismuth and bromine to act together in presence of a little water, driving off the excess of bromine by a current of air, and subliming, or rather distilling, the residue.

Victor Meyer has recently published a note on this compound (*Annalen*, 264, 122). He prepared it by gradually adding *finely* powdered bismuth to bromine contained in a retort. The combination of the two elements takes place slowly, several days being required, at the ordinary temperature, to complete the reaction. The mixture is then distilled, bromine and bromide of bismuth passing over, and a considerable amount of bismuth remaining behind. The latter is again powdered and treated in the same manner. To obtain the bismuth bromide pure, it must be distilled several times. It is finally obtained as a handsome orange-red mass, of a radiately-crystalline or grapelike form. It can be boiled, without decomposition, for many hours, in a flask provided with an upright condenser. Its vapor is deep-red, very much like that of sulphur or phosphorus sulphide.

In poisoning, if the patient is unruly (says the *Dixie Doctor*) don't waste time. Throw $\frac{1}{16}$ to $\frac{1}{8}$ grain apomorphia under the skin, and then watch patient vomit freely, fully, remorselessly, and from his boots up.

Quinethyline, a Homologue of Quinine.

MESSRS. E. GRIMAUX and A. ARNAUD recently announced that they had succeeded in converting cupreine (the alkaloid obtained from cuprea bark) into a homologue of quinine. While this has no immediate practical bearing upon the successful working of a process for making synthetic quinine, yet any step in the direction of recognizing the true constitution of quinine is of importance. We have just received (in *Compt. Rend.* of June 15th) a further contribution by the same authors on this subject.

Their first task was to prepare cupreine absolutely free from quinine. This was accomplished by extracting the latter with ether, or, better still, with chloroform, in either of which the cupreine is much less soluble than quinine.

The pure cupreine can be converted into the new alkaloid by treating sodium-cupreine either with chloride or bromide of ethyl, at a temperature of 120° to 130° C., or else with ethyl nitrate. The result is an ethyl sulphate of the new alkaloid, $C_{19}H_{21}N_2O$, which may be regarded as a sulphate of a compound of the new alkaloid with the unsaturated remainder C_2H_5O, viz., $C_{19}H_{21}N_2O.OC_2H_5$ or $C_{21}H_{26}N_2O_2$. This new body is a white, amorphous substance much resembling quinine, capable of forming a crystalline hydrate, polarizing to the left, and forming both a basic and a neutral sulphate.—After *Compt. Rend.*

Hints about Perfumes.

IT is well known that the addition of fresh milk to an alcoholic solution of essential oils, up to a point when the latter are just beginning to separate, is an excellent way to make the odor of the finished preparation more lasting, there being just sufficient butter fat introduced to "hold" the aroma for some time after the alcohol has evaporated.

An expert has recently informed us that the best effects are produced by using *hot* milk. Moreover, it is necessary to ascertain just how much milk is required to reach the point when the oils are *beginning* to separate, since it would be a waste of money to cause the separation and loss of more than a very small proportion.

The proper way to proceed is as follows: When the alcoholic solution of oils is completed, remove a small, exactly measured quantity, say 1 fluidounce. Now add to it, from a measured quantity of water, in a small graduate or burette, small portions at a time, towards the end in drops, until the mixture is distinctly opalescent, without showing oily drops either on the surface or at the bottom after standing about one hour. The next point is to ascertain how much milk will have to be taken to equal the amount of water that has been found necessary. Now, cow's milk contains about 88 per cent of water. That is, if we wanted to add to some other liquid 88 parts of water in the form of milk, we would have to take 100 parts of the latter. Assuming that we have found, by experiment, that we require 15 minims of water to render the alcoholic solution opalescent, we would find the equivalent quantity of milk by multiplying 15 with the modulus 1.055. This is obtained thus: One fluidounce of milk, at about 60° F., and of the specific gravity 1.030, weighs about 470 grains. The latter consist of about 433.6 grains of water (88 per cent) and 36.4 grains (12 per cent) of solids. But the 433.6 grains of water equal 455 minims. That is to say, every fluidounce of the milk contains 455 minims of water. We have, therefore, the proportion:

$$455 : 480 :: 15 : x$$

$$x = 15 \times \frac{480}{455}$$

$$x = 15 \times 1.055$$

In this special case, then, x would be 15.825, or practically 16 minims. But the same modulus will hold good for any denomination of measure. The rule then would be, multiply the number of minims, or fluidounces, or pints, etc., of water found required by experiment, with 1.055, and the result will be the corresponding number of imnims, fluidounces, pints, etc., of milk required.

If it is desired to *weigh* the milk, after determining the water by *measure*, it is only necessary to multiply the number of minims, fluidounces, pints, etc., by the modulus 1.033, which is found in a similar manner to that previously developed.

Japanese Lacquer.

THE material for the Japanese "lacquer" industry is obtained from the lacquer tree, *Rhus vernicifera* DC. (Japanese, *urushi-no-ki*), which is cultivated in China and Japan, and usually attains a height of from 24 to 30 feet, with a circumference often exceeding 3 feet.

Lacquer is obtained by making incisions in the tree, usually when it has attained the age of about ten years. The best time for obtaining lacquer is the middle of summer, as at this time both the quantity and the quality of the juice are most satisfactory. Almost all the workmen engaged in collecting lacquer are from the Province Echizen, the inhabitants of which are in the habit of hiring out for certain parts of the year. The large operators in lacquer purchase from the peasants owning the lacquer districts a certain number of trees, which are then turned over to the workmen, each of whom has usually assigned to him one thousand young trees or between six to eight hundred older ones, which occupy his time during the whole summer.

The price of the trees at the present time is about $70 to $90 per hundred. The first operation of the workman is to strip the stems of the trees of dead bark and adhering moss. Next he makes an incision at the lower end of the stem by means of a specially formed knife, in a horizontal direction, the incision being about 2 Mm. wide, semi-circular, and passing through bark and bast. Next he cleans this circular cut by means of the pointed end of his knife, in order to remove bark, chips, etc.; then he makes similar incisions alternately on opposite sides of the stem at intervals of about 4 inches, as high up as he can reach. In this way he goes from one tree to the other, treating them in the same manner. After ten or fifteen trees have thus been provided with incisions, he returns to the first one and collects the exuded juice by scratching it out from the cut.

This juice appears in the form of a grayish-white, viscous mass, which exudes very slowly, turns rapidly yellowish-brown by exposure to the air, and afterwards turns black.

After the lacquer has been carefully removed and transferred to a little vessel which the operator carries in his left hand, he goes to the next group of trees, which he treats in the same manner.

It requires five or six days for him to return to the first group, when he makes new incisions somewhat deeper than the first, which are then cleared of exudation in the same manner. Since this operation is repeated usually from ten to twenty times on each tree, it follows that the workman requires eighty to one hundred days to get through with his work. In many cases the trees are not intended to be saved, hence in these cases the branches are incised in a similar manner, the tree is finally felled, and the last remnant of the juice extracted by means of hot water. The lacquer thus obtained is the poorest quality and is chiefly used for priming.

The best lacquer is that which is obtained from the lower part of the stem and during the hottest season of the year.

If the trees are not intended to be destroyed, they are treated in a much more sparing and careful manner.

A single tree, when completely exhausted, usually furnishes between 25 and 50 Gm. of the crude lacquer. The latter is not in a condition to be used immediately for polishing purposes, but has to undergo a process of clarification, being for this purpose several times filtered and triturated in flat tubs until it is homogeneous. This sort of lacquer is known on the price lists as "seshime," and is used both for priming and for final polishing.

For the preparation of the finer qualities of Japanese lacquer, it has to undergo a still further operation, such as complete deprivation of the water and the admixture of various other substances, such as cinnabar, red oxide of iron, and other coloring agents.

The Number of Tubercle Bacilli in Phthisical Sputum.

An editorial of the *Medical Record* of July 18th gives some interesting data and figures regarding the probable number of bacilli tuberculosis. We reproduce it here, but have taken the liberty of making some needed corrections in the figures.

Dr. E. H. Nuttall, of Johns Hopkins University, has shown that phthisical patients expectorate from 250,000 to 4,000,000,000 bacilli in twenty-four hours. Taking the average of, we will say, 100,000,000 per day, the patient would expectorate 36,500,000,000 bacilli a year, and if he lives three years the total number of micro-organisms expectorated during his illness would be 109,500,000,000. Or multiply the annual output of 36,500,000,000 by 70,000, the number of cases of phthisis in this country, and we are confronted with the sanitary problem of destroying 70,000 times 36,500,000,000 microbes every year.

These are rather discouraging figures, but it may be supposed that the vast majority of tubercle bacilli in the sputum die as the result of intercurrent disease or a pitiless environment.

Formosa Camphor.

Formosa camphor is obtained from the *Laurus Camphora*, immense forests of which extend over most of the lower ranges of hills in the island, extending up the lower slopes of the mountains inhabited by the savage tribes. Many of these forests have not been touched, and the statement that the camphor supplies in South Formosa are becoming exhausted applies only to those districts which are purely Chinese. The supply from other parts is practically inexhaustible. Even in purely Chinese districts it is only at certain places that the supply is falling off, in consequence of the reckless manner in which the trees have been destroyed, partly for the sake of the timber and camphor, and partly, no doubt, simply to clear the ground for cultivation.

It has been often stated that the method of obtaining crude camphor in Formosa is by steeping the chopped branches in water, and boiling until the camphor begins to adhere to the stick used for stirring, when the liquor is strained, and by standing the camphor concretes. By this method it does not necessarily follow that the tree is destroyed; in fact, with a little care there is no need that this should be. But although this method may have been in use in former days, it certainly is not now. On the contrary, I am assured by several natives engaged in the trade, whom I have questioned on the subject, that the yield of camphor from the branches is too small to repay the labor of extraction.

The method in general use now is as follows: The camphor expert selects a tree and scrapes into the trunk in different places, using an instrument somewhat resembling a rake, with a view of ascertaining whether it contains sufficient camphor to repay the labor of extraction. A tree is said not to be worth anything for camphor purposes until it is fifty years old, and the yield is very unequal; sometimes one side only of the tree contains enough camphor to satisfy the expert, and in this case that side alone is attacked. The trunk is scraped to as great a height as the workmen can conveniently reach, and the scrapings are pounded up and boiled with water in an iron vessel over which an earthenware jar, specially made for the purpose, is inverted. The camphor sublimes and condenses on the jar, which is removed from time to time, scraped, and replaced. The root of the tree, and the trunk for some eight feet up, contain, as a rule, the greatest quantity of camphor. If the scrapings obtained from the trunk yield well, the chipping is continued until in the end the tree falls. The roots are then grubbed up, as it is certain they will give a proportionately good return. If, however, the scrapings do not turn out well, the tree is abandoned and work is commenced on another. No attempt is made to extract camphor from the fallen trunk or from the branches. In some cases the trunk is sawn up into timber, but this depends on the locality; from many districts, owing to absence of roads, timber would not pay for its transport.

It is impossible to imagine a more wasteful method of procedure, and it is fortunate that the camphor forests of Formosa are practically inexhaustible.

The quantity of campher produced depends, of course, simply on the amount of labor employed in the business. Ten of the iron pots mentioned above and their accompanying jars make up what is called a "set," and are worked by four men. One set will produce about 65 pounds in ten days, or, say, 1¾ cwt. a month, but this only under the most favorable circumstances; a fair average is about 1¼ cwt.

Recently a change has been made in the camphor monopoly. It is now proposed by the Chinese authorities that the camphor stills shall be licensed before they are permitted to work. The cost of the license will be equivalent to a tax of about 22*s.* 6*d.* per cwt.—a heavy tax, seeing that the actual value of the camphor at the place of production is very little over this amount.—Consul Warren's Report, after *Pharm. Journ.*

Valerianate of Antipyrin and Quinine.

E. Sochaczewski directs this compound to be prepared in the following manner (*Bulletin Commercial*):

Dissolve any desired quantity of valerianate of quinine in a sufficient quantity of 90-per-cent alcohol to obtain a saturated solution. On the other hand, dissolve an equal weight of antipyrin in the smallest possible quantity of distilled water. Mix the two solutions in a crystallizing dish, and warm gently at a temperature not exceeding 50° C. If a higher or too prolonged a heat is applied, the product will turn yellow. This always happens, under such circumstances, with salts of antipyrin; even sunlight has this effect.

If good crystals are expected, only the least possible amount of water must be used. At a certain moment the mixture becomes thick, crystals develop rapidly and often attain a length of 6 Cm.

A New Gold-colored Alloy.

An alloy of copper and antimony in the proportion of 100 to 6 is made by T. Held by melting the copper and subsequently adding the antimony, and, when both are melted and intimately mixed, fluxing the mass in the crucible, with an addition of wood ashes, magnesium, and carbonate of lime, which has the effect of removing porosity and increasing the density of the metal when cast.

The alloy can be rolled, forged, and soldered in the same manner as gold, which it very closely resembles when polished, the gold color being unchanged, even after long exposure to ammonia and acid vapors in the atmosphere.

The cost of the alloy in the ingot is stated at about twenty-five cents per pound.

Administration of Amylene Hydrate.

According to *Nouveaux Remèdes*, a teaspoonful of amyl hydrate may be taken at night in a small glass of beer, but requires to be stirred for about seven minutes to insure its solution. Instead of this the following may be taken as one dose:

℞. Hydrate of Amylene.	ʒ ss.
Syrup of Bitter Orange.....	ʒ ss.
Orange Flower Water,	
Water.	āā ʒ i.

Its solubility in beer or water is about one part in eight.

It may also be given in capsules containing each one-quarter of a drachm, three or four being taken for a dose.

New Alkaloid from Seeds of Conium.—The highest boiling portions of crude coniine contain a new base, which can be separated by repeated fractional distillations in vacuum and subsequent crystallization. It crystallizes in needles melting at 98°, and dissolves readily in alcohol, ether, and chloroform; it boils at 230°-233°, and has the composition $C_8H_{17}NO$. It is therefore isometric with conhydrine, and the name *pseudo-conhydrine* has been suggested by Ladenburg, who has examined the alkaloid.—*Chem. Zeitung.*

American Druggist

AN ILLUSTRATED BI-WEEKLY JOURNAL.

VOL. XX., No. 15. WHOLE No. 213.

WILLIAM WOOD & COMPANY,
PUBLISHERS,
56 & 58 LA FAYETTE PLACE,
NEW YORK, N. Y.

SUBSCRIPTION PRICE per year, - - - - - - $1.50
SINGLE COPIES, - - - - - - - - - .10

Address all communications relating to the AMERICAN DRUGGIST *to* WILLIAM WOOD & Co., *56 and 58 La Fayette Place, New York City, to whose order all postal money orders and checks should be made payable.*

The AMERICAN DRUGGIST *is issued on the 1st and 15th of each month. Changes of advertisements should be received before the 5th and 20th. New advertisements can occasionally be inserted after the 10th and 25th.*

INFORMATION WANTED.

OUR *readers will confer a favor by answering any of the following questions and referring to them by number. We will undertake to forward the answers to inquiries when the request for information is accompanied with a directed envelope and postage. The names of the respondents (unless otherwise indicated) will be published in the next issue of the journal.*

No. 2,527.—Formula for **Osbern's Syrup.**

No. 2,528.—In what States can a Canadian pharmacist, registered, have his diploma indorsed, with necessary fees if needed, and what rules regulate the druggists' liquor license in such States?

No. 2,529.—Method of transferring pictures, photographs, etc., from paper to glass.

No. 2,530.—Where can paraffin paper be obtained?

No. 2,531.—How to give a very dark black color to a solution of shellac or rosin in *wood alcohol* (not turpentine).

REPLIES.

No. 2,525.—**Coloring Coal Oil Red.** With alkanet root. Put it in a bag and suspend it in the oil.

W. A. SHANNON,
Mercersburg, Pa.

ANSWERS.

No. 2,532.—**Fine Toilet Soaps.** We are asked to mention some books giving full instructions and formulas for making all kinds of the finer soaps. We presume that our inquirer only means fine toilet soaps, such as can be advantageously prepared even on a small scale. In this case we can refer him to either of the following works: "The Art of Perfumery," by G. W. Septimus Piesse, 8vo, London. "Die Fabrikation der Toilette-Seifen," von Friedrich Wiltner, 8vo, Wien (Hartleben). Both can be obtained from importing book dealers.

No. 2,533.—**Syrupus Fuscus** (M). Syrupus fuscus means "brown syrup," and is the modern Latin term for molasses.

No. 2,534.—**Paraffin Paper.** This is made in the same manner as wax paper. On a small scale it may be prepared by placing a sheet of paper upon a hot surface, and rubbing it over with a piece of flannel in which a lump of paraffin is wrapped. On a large scale such paper is prepared by passing a so-called "endless" roll of paper through heated cylinders covered with felt, which are slowly and evenly fed with melted paraffin. It is then either cut into sheets or put up in rolls.

No. 2,535.—**Chloride of Gold and Sodium.** Treat gold coin with four times its weight of aqua regia at a gentle heat. The silver which is present will be converted into chloride, and finally be left behind. When the coins have been entirely disintegrated and apparently dissolve, evaporate the liquid (without previous filtration) in a tared flat porcelain capsule, on an oil or glycerin bath, at a temperature of 115° C., to dryness. The object of this is to get rid of the excess of hydrochloric acid. Weigh the capsule and contents, then treat the latter with distilled water until the chloride of gold is extracted. Dry the capsule, which now contains only the chloride of silver, and weigh again. The difference is the chloride of gold in aqueous solution. Add to this an amount of pure chloride of sodium equal in weight to that of chloride of gold, calculated as dry, and carefully evaporate to dryness at a temperature not exceeding 100° C.

No. 2,536.—**Embalming Fluid.** A very efficient and at the same time inexpensive embalming fluid is that known as Morell's. The formula is as follows:

Arsenious Acid	14 oz. av.
Caustic Soda	7 oz. av.
Carbolic Acid	a sufficient quantity.
Water	enough to make 100 oz. av.

Dissolve the arsenious acid and the caustic soda in 40 ounces of water by the aid of heat. Allow the solution to cool, and add to it just enough carbolic acid to render it opalescent. Finally add enough water to make the product weigh 100 av. oz.

No. 2,537.—**Piperazine** (Reading). Piperazine is said to have the property of dissolving a large proportion of uric acid. One part of the urate of piperazine is soluble in about 50 parts of water, while urate of lithium requires 368 parts of water for its solution. Piperazine is not toxic nor caustic. Its dose is from 5 to 15 grains. It is in form of shining, crystalline plates. At present it costs about $1.00 per gramme. Fuller information on this subject will be found on page 192 of the current volume of our journal.

Glycerite of Salicylate of Sodium, prepared by dissolving 4 to 6 parts of the salt in enough glycerin to make 100 parts, is highly recommended by S. C. Inglessis (*Semaine méd.*) as an external application in erysipelas. It is to be applied every two or three hours, and the part then covered with salicylated cotton. At the same time the sodium salt is also given internally, in doses of 0.2 Gm. (4 grains).

Zinc Glue for Stiff Surgical Dressings.—Treutler recommends a preparation, first suggested by Unna, for obtaining stiff surgical dressings, such as are applied to fractured or dislocated limbs. It is as follows:

Oxide of Zinc	10 parts
Gelatin	30 "
Glycerin	30 "
Water	30 "

This is thickly applied and rubbed into the muslin or gauze forming the bandage. A thinner preparation contains 20 parts of gelatin and 40 parts of water, the other ingredients remaining the same.—*Med.-chir. Rundschau.*

To Prevent Silver from getting Black from the absorption of sulphuretted hydrogen, one of the most efficient methods is to wrap the objects in paper containing or coated with white of lead. The latter may either be applied to the surface of the wrapping paper by means of starch paste, or the paper may be impregnated with a solution of acetate of lead, dried, then impregnated with a solution of sodium carbonate, and again dried. The paper will now contain acetate of sodium and carbonate of lead.

Only such objects can be fully protected by this paper as can be completely wrapped therein, so that the air may be entirely deprived of hydrogen sulphide.

CORRESPONDENCE.

Aristol.

Editor of American Druggist:

Under the heading "Aristol," your issue of June 1st (page 171) contains an abstract, taken from the *Pharmaceutical Journal*, of a paper by Mr. Reuter, which treats of the tests of aristol, and leads to the result that the commercial article must be considered as impure. I wrote a reply to this, which appeared in No. 11 of the *Apotheker Zeitung* (Berlin). It is there shown that the accusations against aristol are based upon unfamiliarity with the subject, as well as upon want of care during the analytical work. Reuter found that if aristol is triturated with water it yields a filtrate, the residue of which, when treated with fuming nitric acid, gives off iodine. He concludes from this that the preparation contains alkali iodides.* This conclusion would have been justified if the constituents of such a compound had been demonstrated to be present. But this was not done. Indeed, the yellowish residue [which the filtrate leaves on evaporation] is not an alkali iodide, but a water soluble organic iodine compound. On heating this residue on platinum it carbonizes and gives off iodine—a behavior which is foreign to an alkali iodide, the latter being a relatively fixed salt. On heating more strongly the carbon is completely burned up, and if the trace of residue is now taken up by water no characteristic color [no color characteristic of iodine] is obtained by treatment with fuming nitric acid and starch, or with chloroform. Hence the presence of alkali iodides in aristol may be regarded as refuted.

These water-soluble organic iodine compounds are formed when aristol comes in contact with water, and may be continuously produced by digestion with water. Their formation is due to a secondary process, since iodine is previously set free, which, however, at once enters into combination again to form those soluble compounds. The intermediary liberation of iodine may be demonstrated by triturating dampened aristol with solution of starch and allowing to stand several hours. This may be repeated with the same result any number of times.

Reuter has ignited powdered aristol, extracted the carbonaceous residue with water, and with this obtained the iodine reaction. From this he again concludes that the preparation contains alkali iodides. It is a well-known property of many bodies that they can be completely burned up only with very great difficulty. As an example I need only mention the determination of ash in many articles of food, particularly in spices. Thus, for a complete incineration of pepper, many hours' ignition in a muffle furnace are required, so as to obtain a clean ash. Aristol, likewise, is very difficult to incinerate, and it is necessary to moisten the carbonaceous residue repeatedly with water to burn it up completely. Had Reuter done this he would have found that aristol yields no ash at all, least of all one which gives a reaction for iodine. Reflection alone should have taught him that when a substance soluble in water is suspected to be contained in one properly insoluble therein, not the substance itself, but its aqueous extract, should be examined for this purpose.

Reuter dissolved aristol in ether, and obtained a residue which he separated by filtration. In this he also proved the existence of iodine. But even here the conclusion is fallacious, for it would have been only necessary to ignite the residue in order to convince the analyst that this residue, after ignition, no longer contained iodine, but that it volatilized with liberation of iodine. By means of the simple reactions with silver nitrate, mercuric chloride, etc., the presence of alkali iodides is not absolutely demonstrated, for all water-soluble iodine compounds respond to them. As already stated above, iodine is set free as an intermediary product. Hence, *minute quantities of iodine must* be contained in aristol.

But aristol itself is so easily decomposable that its prolonged contact with iodide of potassium causes iodine to be set free—that is, produces decomposition; hence it is wrong to examine aristol for free iodine in this manner. Yet Reuter has the excuse of being unfamiliar with the properties of aristol.

On triturating aristol with glycerin, and adding a few drops of starch solution—a solution of starch in water, of course without addition of zinc iodide—a reddish-violet tint will appear, which corresponds to barely 0.02 per cent of free iodine.

For the purpose of purifying aristol, Reuter proposes to treat it a short time with glacial acetic acid, because the resulting product would then (1) have a handsomer color, and (2) would be completely soluble in ether. Recognizing these two facts as true, it must nevertheless be stated that such a treatment produces a body which can no longer be regarded as di-iodo-di-thymol (which is equivalent to aristol). For, while aristol contains 48 per cent of iodine, the product produced by the intervention of glacial acetic acid contains only 30 per cent. This may be easily demonstrated by performing the experiment. It will be seen that the filtrate contains much free iodine, and is rendered deep blue by starch. Treating aristol with glacial acetic acid will, therefore, not result in its purification, but change it completely and convert it into an absolutely *inert* body.

Finally, as regards the reaction of identity, by means of sulphuric and glacial acetic acids, which is given by Reuter, it is fallacious, because this produces a liquid *always* colored with iodine. Moreover, aristol is a derivative, not of thymol itself, but of di-thymol.

DR. FELIX GOLDMANN.

ELBERFELD, June 26th, 1891.

"Patents" and Pharmacists.

Editor of American Druggist:

In your editorial, issue of July 1st, you arraign the pharmacist, holding up to view his two attitudes towards "patents," *i.e.*, his former apologetic course in regard to handling them, and his present fuss about the loss of the trade.

I am sure that I voice the sentiment of pharmacy in what I say below.

We admit the two attitudes, and that they are wide apart—as wide, indeed, as are the Rockies and the Alleghenies; and the geographer who brings to notice those two "attitudes" of America without notice of the reality between, states the truth of America as closely as your article states the true position of pharmacy on the question of "patents."

The thinking pharmacist knows that patents are an unmixed evil in the community; not that they are not effective remedies, but—

1. They have already prostituted "domestic practice of medicine" from the approach to exact science, indicated by the use of simples, to the superstition, not to say fetichism, of dependence on "patents."

2. The practice of using "patents" is at least twice as costly to the public, even when the distributer's profit is cut out, as the better and more scientific domestic practice by agency of simples.

3. It is a retrograde movement, that appeals only to the pessimist, the logical sequence of whose position is the return to a materia medica of toads, excrements, and other vile things.

Knowing all this, we are striving to hold on to the sale of patents, *because they are all there is left of a sometime extensive trade in domestic practice supplies;* hence the sale of patents being a metamorphosed branch of that part of trade that we may claim as *exclusively* ours, we are loath to see it go from us. So it falls out, when the fogs of superficial view are cleared away, that our later attitude does not stultify our former position; it is only to keep half a loaf rather than to have no bread.

I fail to see that the relation of the physician and pharmacist is disturbed by the controversy; neither is more than equal to his day and generation, and honors are easy between them. While the former runs after the su-

* As we have already once before explained, we disapprove the term "alkaline iodide" in the sense of "iodide of an alkali metal" (such as iodide of sodium, iodide of potassium). These iodides may be *neutral* or *alkaline*, or even *acid*. We may sometimes wish to speak of some iodide (no matter whether of an alkali element or of a metal, etc.) as being *alkaline*—that is, as having an alkaline reaction. For this purpose the term "alkaline iodide" is appropriate, just as much as when we speak of "alkaline phosphates" in contradistinction to "neutral" or "acid" phosphates. In order to express the idea "iodide of an alkali element," we decidedly prefer the term "alkali iodide," in which the word "alkali" is used as an adjective.—ED. AM. DRUGG.

perstition of pharmaceutical extravagances, the latter panders to the fetichism of patent medicines. Who is competent to demand that one shall be superior to the times? Both are treading the mill of the gods that grinds slow but exceeding fine, to the end of charlatanism in one and empiricism in the other.

D. G. STOUGHTON.

HARTFORD, CONN.

Wiesbaden Elixir.

Editor of the American Druggist:

Reading the article "Concerning Wiesbaden Elixir" in the AMERICAN DRUGGIST of July 1st, recalls to my mind the filling, for a German customer, a recipe written by a German pharmacist. As the ingredients are the same with a few additions, and the quantity nearly the same as given in the formula in the DRUGGIST, I herewith submit a copy of the same.

The owner of the recipe immigrated to this country about 25 years ago from the near neighborhood of Wiesbaden, as you will notice that the weights given are the old weights used before the introduction of the metric system in Germany:

ORIGINAL.			TRANSLATION.	
R.	2	Loth Socotrinische Aloe,	R. Socotrine Aloes....	500 grains.
	2	Quentchen türkische Rhabarber,	Rhubarb.....	50 "
	2	" venetianische Theriak,	Theriac, "Venetian,"	50 "
	1	" wiener Saffran,	Saffron, "Vienna,"	25 "
	1	" Lerchenschwamm,	Agaric.....	25 "
	1	" Angelikawurzel,	Angelica Root.....	25 "
	1	" Engelsüsswurzel,	Polypody Root.....	25 "
	1	" Myrrha,	Myrrh.....	12 "
	½	" Zitwerwurzel,	Zedoary Root.....	6 "
	½	" rothen Enzianswurzel,	Gentian.....	6 "
	3	" Cardobenedictenkraut,	Blessed Thistle.....	75 "
	3	" Tausendgüldenkraut,	Centaury Herb.....	75 "
	1	" Kalmuswurzel,	Calamus Root.....	25 "
	1	" Wermuthskraut,	Absinthe.....	25 "
	3	" getrocknete Pomeranzen	Bitter Orange Peel.	75 "
	½	Quart guten Branntwein.	Brandy.....	18 fl. oz.

[The translation is by us. The weights are close approximations to the original. "Branntwein" is not necessarily equivalent to "Brandy," as we understand it, but the latter may be used, of course. The formula above given has been in use, variously modified, for a very long time. Its last "improver" was Warburg, who replaced some of the bitters by quinine.—ED. AM. DRUGG.]

MAX L. KAESTNER.

BUFFALO, N. Y.

NEWS AND NOTES.

New York State Pharmaceutical Association on Proprietary Goods.

THE New York Pharmaceutical Association, at their annual meeting on June 23d, at Hotel Champlain, New York, passed the following resolutions unanimously. The italicized sentences in the recommendations to the Association of Manufacturers and Owners of Proprietary Preparations have been added in order to strengthen the document which was passed, at the request of the Association, by the American Pharmaceutical Association at New Orleans, April 28th:

"We recommend that proprietary articles be sold hereafter upon the following conditions:

"1. Manufacturers and owners of proprietary preparations on the contract plan agree to sell their products to druggists only.

"2. Wholesale druggists or distributing agents agree to sell contract goods solely to druggists, excepting in those localities where no druggists are in business. Wholesale druggists are not to supply any dealer on the cut-off list. Further, wholesale druggists agree not to substitute when any order is presented for any articles on the contract plan.

"3. Retail druggists to sign an agreement including all contract or rebate articles, that they will not violate the conditions of said agreement; and, further, agree not to substitute another article for any article requested that is on the contract or rebate plan, nor deliver such goods to any dealer on the cut-off list; and it is hereby provided that the names of all druggists be placed upon the cut-off list who fail to sign the agreement.

"4. Under no consideration shall any manufacturer, wholesale druggist, or retail druggist, directly or by collusion, supply any proprietary preparation on the contract plan to dealers on the cut-off list.

"5. Manufacturers, wholesale druggists, and retail druggists shall refuse to sell to commission merchants, brokers, expressmen, or agents any article on the contract plan, unless such sales are for export or for purchasers who are removed from domestic competition.

"6. Manufacturers and wholesale druggists or distributers of articles on the contract plan agree not to sell such articles to any retailer of said articles who will not agree to sell at full retail prices. *Neither will manufacturers or owners of proprietary preparations on the contract or rebate list, or wholesale druggists, sell any article on that plan at retail unless at full retail prices.*

"7. Manufacturers of proprietary articles on the contract plan to make their contracts in such a manner as not to materially increase the purchasing price of the retailer.

"8. *Any manufacturer or owner of any proprietary medicines on the contract or rebate plan*, wholesale druggist or retail druggist, violating his contract, shall be placed on the cut-off list as a penalty for such violation."

The conditions which are presented above have been submitted to the Association of Manufacturers of and Dealers in Proprietary Articles, with the view of aiding them in the work of solving the cut-rate problem, the details of the said plan being left to the judgment of that Association.

The Illinois Pharmaceutical Association.

THE Committee on Arrangement of the Illinois Pharmaceutical Association has made the preliminary arrangements for the twelfth annual meeting at Kankakee, August 25th, 26th, and 27th. A large tent has been secured, and the sessions will be held in the magnificent grove adjoining Hotel Riverview. The following programme has been formulated:

Tuesday, August 25th.—Opening ceremonies at 2 P.M., by an address of welcome by Hon. Geo. R. Letourneau, mayor of Kankakee; reception of delegates; report of Committee on Entertainment; annual address of President A. A. Culver, Momence; report of Secretary C. S. Hallberg, Chicago; report of Treasurer A. L. Moody, Lockport; report of Executive Committee.

8 *P.M.*—Inaugural ceremonies of the Knights of the Golden Pestle; tableaux vivants with fulminations; grand reception and ball at Hotel Riverview.

August 26th, 9 A.M. to 1 P.M.—Reports of committees; legislation; scientific papers; trade interests.

Afternoon and Evening.—100-meter foot race; 500-meter mule race; 100-meter fat men's race.—For the ladies: Potato race, egg race.—Baseball: C. C. C. vs. K. K. K.; tug of war for grand prize; single-scull boat race, bicycle race; grand rally of the K. of G. P.; phosphorescent illumination: atmospheric vibration by the K. G. P. band; grand ball and refreshments.

August 27th, 9 A.M. to 1 P.M.—Election of officers; election of nominees for vacancy on Board of Pharmacy; report on adulteration; on Board of Pharmacy records; on reorganization; installation of officers; adjournment.

Afternoon and Evening.—Steamboat excursion on the Kankakee River; 100-meter wheelbarrow race; 25-meter three-legged race; 50-meter lame legged race; backward race for ladies; football, Illinois vs. Egypt; double-scull boat race; 50-meter aquatic contest; Delsarte exhibition on campus; grand finale, handshaking.

ENGLAND.

EXTENSIVE preparations are being made for the annual meeting of the British Pharmaceutical Conference, which takes place this year at Cardiff, South Wales. So far not many papers are promised, and the secretaries have issued a circular to former contributors, wherein they state that contributions from willing and capable workers are much sought after; but they trust that loyalty to the

Conference will prevail, and that assistance will be given so as to make the scientific side of the meeting a success. The secretaries are W. A. H. Naylor, F.C.S., F.I.C., manager of the laboratory of, and partner in, the firm of Hearon, Squire & Francis, of Southwark street, London, and F. Ransom, F.C.S., a member of the Board of Examiners of the Pharmaceutical Society, and partner in the celebrated firm of extract makers at Hitchin. The president of the Conference this year is William Martindale, F.C.S., whose name is widely known as a leading authority on pharmacy and author of the "Extra Pharmacopœia." This work has already reached its seventh edition in nearly as many years, and is a wonderfully compact book, containing valuable notes on new drugs and additions to materia medica. The value of the book is enhanced by the assistance given by Dr. Wynn Westcott in its compilation, who has tabulated all the medical references to the drugs from the leading medical journals.

Mr. Martindale, who was for some years teacher of pharmacy and demonstrator of materia medica at University College Hospital, was also an examiner (in dispensing) of the Pharmaceutical Society, which he dropped to take a seat upon its council. He is most genial and courteous in disposition, a clear and distinct speaker, never rising, however, to heights of oratory, and emphatically a practical pharmacist. It is one of the finest compliments to the modern disciples of pharmacy to find that nearly every medical man in the land possesses and relies upon his copy of Martindale's "Extra Pharmacopœia" or Squire's "Companion to the Pharmacopœia." These works are here what Remington's treatise and the dispensatories are with you.

Each year the committee which is supposed to look after the interests of the Conference issues a blue-list, containing a numerous assortment of very indifferent subjects for investigation. Unlike that issued by the A. P. A., this list is absolutely neglected by the leading contributors. Nor is this difficult to understand, when the following illustrate pretty clearly the kind of investigation which this armchair committee suggests: "Report on the efficiency of the purification of potable waters by alum. It is stated to remove diseased (*sic*) germs and ptomaines." "A research required on castor oil having for its object the isolation of the purgative principle," etc. It is evident from these that the committee has a profound opinion of the ability of the pharmacist to grapple with bacteriological subjects and chemical problems that have defied years of attempted investigation.

But perhaps the most objectionable feature in this neglected list is the constant recurrence of questions which in one or two isolated cases some young and rash experimenter has ventured to answer. Thus we are still invited to examine the physical and optical properties of the terebene of commerce, in spite of the fact that this was done when terebene was in fashion, and that, as it has quite dropped out of medical practice, it hardly appears worthy of further attention.

The Chemical Society has been having a lively time of late. There is a certain section of Fellows, largely composed of public analysts, who are strongly dissatisfied with the method of election of new Fellows. They desire that some definite qualification of chemical ability should be proved to be possessed by the intending candidate. At present the signature of notable scientific men, who sign the certificate for either personal or general knowledge, is sufficient. The reform section compelled a meeting to take place at the end of last month, whereat they submitted a brand-new set of by-laws, calculated to render the election more difficult and as some indication of ability of candidates. A large and representative party appeared to oppose and maintain the existing *régime*. The direct negative to the new by-laws was proposed by Mr. Carteighe, president of the Pharmaceutical Society, in a slashing speech, and feebly seconded by Sir Frederick Abel. On the same side followed Sir Henry Roscoe, Professor Tilden, and Mr. Warington. The reform party has only one orator of any calibre, Mr. Cassal, but he made good use of his talent and caused considerable excitement. Perhaps the best expression was that of Mr. Warington (of nitrification fame), who said that what the Chemical Society had to fear was not the gentlemen in their midst who were not chemists, but the chemists who were not gentlemen. In the end the reformers were overwhelmed by a majority of nearly 100.

Dr. A. Richardson, of University College, Bristol, has just published experiments which tend to prove that the dark product of silver chloride exposed to light contains no oxygen and is therefore a subchloride. For years photographical chemists have been divided in their opinions as to the nature of this black compound. Many have held very firmly to the idea that it was an oxychloride, as the atomic theory seems averse to a subchloride, silver and chlorine being monads. The darkened product was examined for oxygen, after drying at 110° C. until it ceased to lose weight, by heating in a current of pure hydrogen, the gaseous products being passed through a weighed phosphorus pentoxide tube. The increase in weight of this tube, with quantities of 25 Gm. of dark chloride, was never more than 5 Mgm. or 0.02 per cent—a quantity certainly insufficient to bear out the oxychloride theory.

Some attempt has been made recently to disparage the Ketone chloroform and that prepared from any other source than pure alcohol. It is singular that it has occurred simultaneously with M. Pictet's announcement that he has prepared, by a cold crystallizing method, an absolutely pure chloroform. Several deaths having taken place recently under chloroform, the medical men immediately rushed to the opinion that they were due to these impurities, which up to the present have not been proved to exist. The editor of the *Pharmaceutical Journal* has given his opinion that only chloroform made from pure alcohol should be used, according to the Pharmacopœia. With this very few authorities agree, and Mr. A. H. Mason, London agent for the "Warington" Ketone chloroform, points out that the method given in the B. P. is only stated as a means by which it "may be prepared." As there are no possible chemical differences in the products obtained from the various sources, it is at least a little premature to condemn other methods than one given tentatively in the B. P.

London Market Report.

MINCING LANE, July 15th, 1891.

The fortnightly auctions with drugs took place last week, but the bidding was very quiet and demands were limited. A very fair assortment was offered, much of which was bought in. Aloes, myrrh, opium, and ipecacuanha were in good demand, and prices rose in consequence; but lower tendencies were more general. Quinine is stationary; indeed, a broker described it as indeclinable, as holders ask 22 cents, whilst buyers refuse to offer more than 21 cents. Latest advices from Smyrna announce activity principally for the American market, and prices varying from 1 78 to 1.96 f. o. b. It is expected that the present crop will yield 8,000 cases, whilst over 1,000 remain on hand of the old drug. Mercurials are cheaper, but other chemicals remain unaltered.

The following are current prices:

Acid, citric	per lb.,	$0.40	Mercury, calomel	per lb.,	$0.74
oxalic	"	.07	corrosive subl.	"	.58
tartaric	"	.28	Myrrh	"	.28
Arsenic	per cwt.,	2.88	Oils, refined:		
Bleaching p'wd'r	"	1.92	colza	per cwt.,	6.74
Borax	"	7.02	castor	"	7.52
Cream of tartar,	per lb.,	0.20	cod	"	5.48
Camphor, ref'd,	"	0.40	linseed	"	5.22
Cantharides (Chinese)	"	2.26	olive	"	9.84
(Russian)	"	.84	rape	"	6.12
Cascara	per cwt.,	6.04	turpentine	"	6.78
Ipecacuanha	per lb.,	2.08	Petroleum	per gallon,	.11
Jalap	"	.28	Shellac	per cwt.,	17.2 to 19.6
Mercury	"	.52			

MISSOURI.

WM. E. BARD, of Sedalia, ex-president of the Missouri State Pharmaceutical Association, is considerable of a politician, and takes a view of matters after the fashion of one who is accustomed to managing men and affairs. This probably accounts for one of the recommendations in his annual address this year. He proposed that the State be divided into districts of one or more counties

each, and placed in the hands of local men who are willing to work them in the interest of the Association. "Billy Bard" is well known over the State, and his idea was adopted at the Excelsior Springs meeting.

PROFESSOR FRANCIS HEMM, the new president of the State Association, is a man who will have plenty of good practical recommendations to make in his annual address next year, but he is also one who knows a good thing when he sees it, and never hesitates to take advantage of ideas because they do not happen to be his own. Thus it is that he is hard at work on the subject of county organization as proposed by his predecessor in office. Mr. Hemm will soon have a man selected in each county of the State, who will be entrusted with the duty of organizing his fellow-druggists into a county society which in turn will affiliate with the State Association.

DR. C. C. DAVIDSON, of Eldorado Springs, is the first man to respond with a report of a county association of druggists. The doctor is one of the hardest workers in the State, and has had frequent recognition at the hands of the annual conventions, and we look for him to climb still higher the ladder of fame as a pharmacist.

This project of county organization to assist the State Association should not be confined to Missouri; for it is equally applicable to any or all other States in the country. There are many other places where it is needed far more than here, where we have a good, strong, and prosperous State society. Think of all that could be accomplished by it, if each State had all of its counties supplied with local organizations. With such a power, the National Formulary could be made "national" indeed, and a copy placed in the hands of each druggist of this land. The work could be properly brought to the notice of the doctors, and its preparations prescribed in place of the secret nostrums that are now so frequently ordered by physicians. The revised edition of the Pharmacopœia would also get a foothold in the profession that no previous edition ever enjoyed. It could be made a "United States" working manual as well as authority. The metric system would soon count its adherents by "tens" of thousands, and completely drive to the wall the old foolish systems that now bear the name of "apothecary." The outlook is wonderful, and now is the time for each State association to take hold.

One of the members of the Committee on the Revision of the United States Pharmacopœia, who is quietly but earnestly and effectually working at the task assigned him, lives in St. Louis. Even DR. CURTMAN'S most intimate friends and most frequent visitors to his laboratories hardly realize the great amount of original work he is doing towards the revision of the Pharmacopœia. The doctor is not a man who makes a show of what he does or expects to do, but rather shuns publicity, and thus it is that some of his co-laborers will be surprised to see what a valuable man is of their number. It is not generally known that this eminent chemist is a practical druggist as well as physician, in addition to his purely scientific acquirements The doctor has served his time behind the prescription case, and in former days attended to a large and desirable practice of medicine.

This State will be represented at the Kankakee meeting of the Illinois State Pharmaceutical Association in August. For more than a half dozen years one or more members from Missouri have attended the Illinois conventions, but not until 1891 did any one cross the river from the other side and join with the Missouri druggists. Two Illinois pharmacists found their way over to Excelsior Springs last June, and as a consequence the delegation will be larger this year than ever before.

PROF. FRANCIS HEMM will go to Kankakee for the convention.

PROF. J. M. GOOD expects to go and get the run of an Illinois convention.

DR. C. O. CURTMAN will attend the Wisconsin convention, and stop at Kankakee on his way home.

DR. H. M. WHELPLEY is a regular attendant at the Illinois meetings, and would not enjoy the summer if he missed one of them.

NEW ENGLAND.

BY the late destructive fire, July 14th, in Pittsfield, Mass., Messrs. Farrell & Fahey lost their drug store. Mr. Farrell came to Pittsfield last fall from North Adams and opened the store. A few months since he took in Mr. Fahey as partner, and had just made quite extensive additions to both stock and fixtures. In fact, at the time of the fire improvements in fixtures were hardly complete. They claim a loss of $6,000; insured for $2,500.

Among the recent deaths of pharmacists in New England we notice that of DR. CHARLES M. TRASK, of White River Junction, Vt., who died June 28th. Dr. Trask was a practising physician formerly, going to the war as assistant surgeon of the gallant 5th New Hampshire Volunteers. After the war he practised for a time in Wells River, afterward engaging in the drug business for a time in Boston, subsequently removing to White River Junction to engage in the drug business. He was remodelling his store, putting in plate-glass windows, new fixtures, etc., making it one of the handsomest stores in the city.

T. C. BLOOD & Co., Vermont, are refitting in handsome shape. Bangs is putting in a fine set of oak fixtures. When completed it will "lay over" anything in town.

W. P. BECKFORD & Co. are to close up and retire from business. Mr. Beckford's health has been poor for several years.

C. W. HATHAWAY & Co., of Salem, have opened a new store in the "city of witches."

F. E. FLINT, the well-known Lynn druggist, will open a new store on Washington street, Salem, under the title of W. J. Gearon & Co. Mr. Gearon is a former clerk of Mr. Flint, and has been for the past two years in the employ of F. C. Goodell, of Lowell.

P. L. GAGNON has recently opened a new and handsome store of Whittle's manufacture, under the Corley House, Springfield. Mr. G. is well and favorably known in Fall River, where he was formerly engaged in business.

We regret to notice the assignment of Mr. A. W. Lowe, a promising young pharmacist of Lawrence. He has had ill luck, but we trust will be able to effect a settlement and continue.

MR. HEBER TOWNSEND, of Rockville, Conn., has been forced by dulness of business to call a meeting of his creditors.

O. J. CARROLL, of Worcester, has recently sold his store to his clerk, Mr. Stewart, of the class of '87, New York College.

W. W. ROBINS has sold his store on Main street, Lynn, and has tastily fitted up the store on Front street formerly occupied by W. R. Jormery, and is running it with his accustomed vim.

E. A. BUFFINTON, the well-known pharmacist and manufacturer of homœopathic medicines, of Worcester, has just returned from a year's sojourn in Europe.

W. B. PETTENGILL has just opened his new store on State street, Springfield. It is a beauty. He will continue the one under the Massasoit House as previously.

HARRY COMSTOCK, formerly with H. E. Jones, has recently opened a neat little store on Main street, near Broad, in Springfield.

MR. STIMPSON, formerly in the employ of Weeks & Potter, has opened a new drug store on Lewis street, Lynn.

THE LYNN DRUGGISTS' ASSOCIATION held its twelfth annual meeting June 23d. Mr. E. A. Besson was elected president and J. M. Nelson secretary. Through all trade disasters this association has been able to maintain in all the pharmacies in the city, fifty or more, full retail prices since its organization.

Rust may be removed from finely polished steel, without injury to the surface, by cleaning the article with a mixture of 10 parts of tin putty, 8 of prepared buck's horn, and 25 of alcohol, and then rubbing with soft blotting paper.